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AND

W. HALE WHITE, M.D.

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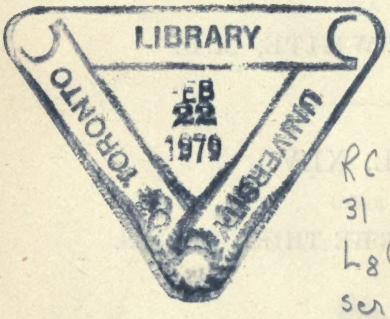

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Newman, Alfred K., M.B., The Club, Wellington, New Zealand
Newman, J. J.
Nisbett, Robert Innes, The Eagles, Overcliffe, Gravesend
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Norman, A., Guy's Hospital
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Scott, Francis, Addison House, Edmonton, Middlesex
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Scott, W. J., Guy's Hospital
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White, Charles, Warrington
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York Medical Society (care of Fred. Shann, Esq., 69, Petergate, York)

In Exchange.

The St. Bartholomew's Hospital Reports.
The St. George's Hospital Reports.
The St. Thomas's Hospital Reports.
The Westminster Hospital Reports.
The Liverpool Medico-Chirurgical Journal (care of Dr. James Barr, 1, St. Domingo Grove, Liverpool).
The Pharmaceutical Journal.
The Transactions of the Hunterian Society.
The Transactions of the Obstetrical Society of London.
American Journal of the Medical Sciences (care of Messrs. Trübner and Co., Ludgate Hill, E.C.).
Annales de Dermatologie et de Syphiligraphie (care of M. le Dr. Ernest Besnier, 87, Rue Neuve des Mathurins, Paris).
Journal de Thérapeutique (care of M. le Dr. Labbée, 10, Rue de Turbigo, Paris).
Revue des Sciences Médicales en France, et à l'Étranger (care of M. le Dr. Hayem, 17, Rue du Sommerard, Paris).
Verhandlungen der Berliner medicinischen Gesellschaft (care of Herr Professor Falk, Bibliothek der Berliner medicinischen Gesellschaft Dorotheenstrasse, 33, Berlin).
Centralblatt für Chirurgie (care of Messrs. Breitkopf und Härtel, Leipzig)
Beiträge zur Medizinal-Statistik (care of Dr. W. Zuelzer, Wilhelm Strasse 68, Berlin, W.).
Upsala Läkareförenings Förhandlingar (per Prof. Hedenius, Bibliothéque de la Société des Médecins, Upsal, Suède).
Le Progrès Médical (per Dr. Bourneville, Rue des Écoles 6, Paris).
Chicago Medical Journal and Examiner (per Dr. W. H. Byford, care of Messrs. W. B. Keen, Cooke, & Co., 113 and 115, State Street, Chicago, United States of America).
Transactions of the American Medical Association (per Messrs. Churchill).
Transactions of the American Gynæcological Society, Clarendon Street, Boston, Mass. (per Messrs. Churchill).
Library of Surgeon-General's Office, U.S. Army, Washington, D.C· (per Mr. B. F. Stevens, U.S. Government Despatch Agency, 4, Trafalgar Square, London, W.C.)
Transactions of the Brooklyn Anatomical and Surgical Society, 28, Madison Street, Brooklyn, New York, U.S.A.
Transactions of the College of Physicians, Philadelphia.
The Albany Medical Annals (per Messrs. Burdick and Taylor, 481, Broadway, Albany).
The Sanitary Record, 15, Waterloo Place, S.W.
Mémoires de la Société de Médecine et de Chirurgie de Bordeaux (per Dr. Demons, Hôpital St. André, Bordeaux).
The Medico-Legal Journal, 128, Broadway, New York.
La Medicina Contemporanea, Via Cisterna dell' Olio, No. 13, Naples.

In Memoriam.

ROBERT EDMUND CARRINGTON.

"Sympathy is the source of influence."

Robert Edmund Carrington was born at Bath, May 10th 1853. His father was the editor and proprietor of the 'Gloucestershire Chronicle;' his grandfather was well known in the south-west of England as "The Poet of Devon." Amongst his writings were "Dartmoor," "The Banks of the Tamar," and many other poems, which their local associations made very popular in a county which has always been rightly proud of its richness in gems of charming scenery, and of those who try to spread their fame.

From a very early age Carrington showed signs of possessing abilities much above those of the average child, and withal he remained the child pure and simple; while he was neither precocious nor priggish, the conversations of his early childhood gave proof of his future thoughtfulness and observation. As a child his great characteristics, and ones which, following him through life, remained with him to the last, were his unfailing amiability and love of work, the latter early gaining for him the name of "Studious Bob." It is to be noted, however, that these studious habits were not of that sort which too often create reserve, and interfere with the enjoyments and brightness of boyhood. Study came to Carrington as naturally as it is irksome to others. A peculiar feature, early noticed in the child, was his odd power of learning his lessons while he had some book of lighter litera-

ture by his side. His habit seems to have been to read part of his lessons, then think awhile, and afterwards to read from the same amusing book which he had by him, and so on until he had finished. Unsatisfactory as this "sandwich" method of reading would have proved with most children, it is certain that with Carrington the effect of one book did not destroy that of the other; with him it seems to have been rather a help than otherwise.

When he was about eight years of age his father moved to Gloucester. To him, a man of much acumen and varied literary attainments, he owed the groundwork of a sound preparatory education. From him he inherited his taste for literary work, of which, at this time, he gave an early instance, foreshadowing his connection with the 'Guy's Hospital Gazette,' and, if life only had lasted, with these 'Reports' also. While at a preparatory school at Gloucester, Carrington brought out, in conjunction with a schoolfellow, a monthly manuscript magazine, which went the round of a list of boy subscribers. To encourage this amateur work, his father used to offer prizes for the best written tale or essay on some historical subject, the only condition being that the subject matter must be original, and not taken from any book.

A little later Carrington entered at the Cathedral School, and soon after lost his father, in 1864.

As would be expected by all who knew his gentle nature, he seems to have felt this loss far more keenly than most lads at eleven would have done. It seems only to have implanted in Carrington the feeling that he would best honour the memory of the dead by striving to fulfil the expectations which his father, while alive, had of him. This object kept steadily in view, marked, later on, every action and plan.

At the King's School Carrington had the good fortune to be under the care of the late Rev. Hugh Fowler, an excellent teacher and most energetic worker. Possessing, himself, the faculty of untiring application, Mr. Fowler had in Carrington a pupil after his own heart, and a warm affection grew up between the two. During Carrington's last year at the school the Dean and Chapter offered a scholarship of £30 for two years. He won this, the first of his successes in a long list of competitive examinations, but as he was leaving the

school to enter the medical profession the scholarship was given to the *proxime accessit.*

Now, as all along, he was greatly beloved by his companions. With them, as with those of later life, he was always "Bob." No other name was, or apparently could be, applied to him. Cheery and companionable, full of life and fun, he was yet a "glutton for work." At all hours, in all seasons, the power of sustained study became, in these years, more and more developed.

After spending a little while at the Gloucester Infirmary—a period which, short as it was, served, together with early home associations, to root very deeply in him the true and ever fresh interest which abided with him throughout his life in things concerning our profession in Gloucester—Carrington came up to Guy's Hospital in 1870. At his entrance he took the second prize in Arts, running second to another persevering worker, and one well known to Guy's students of that day, Cyril Lloyd Jones. In 1872 Carrington gained the silver medal in Botany at the Apothecaries Hall, another Guy's man, W. H. Harsant, now of Bristol, winning the silver medal in Materia Medica. At the preliminary scientific examination of the same year, Carrington was placed first (with the Exhibition) in both Chemistry and Zoology, taking honours also in Botany. In 1874, when passing the first M.B., he won the Exhibition and gold medal in Chemistry and Materia Medica, and the second place in Physiology. In 1876 he was Resident Obstetric and House Surgeon, and towards the close of his student days he read before our Physical Society one of the very best papers ever heard there. The subject, "Alcohol as a Food, Drug, and Poison," gave ample scope to Carrington's laboriousness, and with his wide and accurate knowledge of organic chemistry and physiology he easily won the prize.

In 1877 he was appointed Demonstrator of Anatomy, a post which he held for five years, showing all along that painstaking thoroughness of work which, noticed early in his childhood, was later on developed in his pathological and clinical work, together with that utter unselfishness, habitually unsparing of time and strength, which marked the man. His knowledge of anatomy was thorough and precise. His gentle-

ness and patience of temper made him readily accessible at all times to those in difficulties, while the completeness of his experience of the needs of the London University course made him a most invaluable helper to those who were working for these examinations. The stamp of Carrington's work in this, his first public appointment, and his acquaintance with the needs of others, and his ability to supply them, were well shown by the 'Manual of Dissections,' which he brought out in 1881, a book which was well described by a reviewer in the 'British Medical Journal' as being "as solid a piece of work as was ever put into a book, accurate from beginning to end, and unique of its kind." A new and enlarged edition of this has been recently brought out by Mr. Lane, who, with another attached friend, Dr. J. A. P. Price, of Reading, helped Carrington with the first edition. It was this book, together with his distinguished University career, which led to Carrington's being appointed Assistant Examiner in Anatomy when the press of candidates at the first M.B. led to the need of this appointment. Only those who knew Carrington most intimately realised that these years were the period of the greatest trial of his life, a time in which clouds gathered over his head and threatened to dash with disappointment long cherished hopes. Yet, while those who watched him affectionately, and in whom he confided, were aware that this period of heart-sickening anxiety left a permanent mark upon his gentle, sensitive nature, overshadowing and chequering in some respects the rest of his life, they saw also that they were watching a lesson of braveness in trial, of uncomplaining patience in a time of bitter adversity, such as few others equally tried would have shown. At the time we allude to death had not made those gaps on our Medical Staff which a few years later were to follow each other with the sudden, chilling shocks of great and successive calamities; Dr. Fagge, Dr. Mahomed, and Dr. Moxon were still with us. As far as human foresight could judge, there was but one vacancy on the Medical Staff in the near future. For this vacancy two of Carrington's colleagues, both men of distinguished ability, were at that time likely to compete. It has so happened that each of these friendly rivals became colleagues of Carrington's on the staff without being competitors

for the vacancy for the Assistant Physiciancy. But for a long time there was no sign of any differentiation. Carrington had set his whole heart on succeeding to a vacancy on the medical side at Guy's Hospital; in this he never once wavered, and from Medicine his thoughts never turned aside to the prospect of any other branch of his profession. It must be allowed that in some measure the subject of this memoir was himself answerable for the uncertainty as to whether, after all his brilliant record, he would be elected at Guy's. In some of those gifts which at once charm the eye, and which quickly find a way to the heart, especially of superficial observers, Nature had been to him a little niggardly, and Carrington's memory will not suffer if, for the sake of truth, we add that his days would have been all the smoother if in some little matters of daily life he had been more wont to occasionally sacrifice to the Graces.

Those only who knew Carrington best, realised how this time of long-continued tension, and the heart-sickening anxiety of hopes deferred, together with a severe attack of typhoid fever in 1877, which occurred just before the date of the second M.B. examination, at which he had intended to present himself, affected his subsequent health and life.

Brighter times were, however, in store. In 1880 Carrington was elected Visiting Physician to the Seamen's Hospital at Greenwich, an appointment which afforded him interesting opportunities of bedside observation and pathological work. It was not only as a training ground for similar work at Guy's that this appointment was after Carrington's own heart, his genial temper, his ready sympathy, his interest in the wellbeing of others rather than that of himself, were especially welcomed by sailors. This was well shown by his great popularity and the friendships which he made during a sea trip, which he took after his attack of typhoid fever in one of the Mediterranean Cunarders.

From this appointment at Greenwich, perhaps, sprang Carrington's interest in cases of hepatic disease, an interest which bore fruit in our 'Reports' in the shape of two articles, "Multiple Small Abscesses of the Liver," and "The Concurrence of Fever and Cirrhosis."[1]

[1] It was Carrington's appointment at Greenwich which, together with his

In 1881 Carrington was appointed Medical Registrar, then Demonstrator of Pathology, and in 1883 his long cherished hopes were fulfilled by his appointment as Assistant Physician. There must be many who will remember the lesson of quiet humility which went hand in hand with the deep joy with which Carrington received his congratulations on this appointment. In both the wards and the post-mortem room, which were now to be the chief scenes of his labours, he consistently endeavoured to make his work follow always the lines of his predecessors, being most deeply impressed with the conviction that he would be contrasted and compared with such men as Dr. Wilks, Dr. Moxon, and Dr. Fagge.

In the wards he was welcomed by seniors and juniors alike. The former found him accurate in observation, skilful in diagnosis, and withal cautious in drawing conclusions. Junior students found in him a ready, patient, kindly helper, one who partly from the previous thoroughness of his work, partly from his natural knowledge and haste to meet the needs of others, possessed the rare and happy faculties of knowing what those around a case wished him to say, and of putting simply and convincingly what he himself desired to tell them.

In the post-mortem room the work was also calculated to bring out the characteristics of Carrington. When unravelling the obscure secrets of a difficult case, no trouble was too irksome, no afternoon was too long; he was an example of an earnest, unremitting toiler after truth. No one could have entered the theatre without being struck by his conscientious thoroughness, his grip of the important points in a case, his scrupulous accuracy of statement, his already extensive knowledge of disease, the intervals of thinking broken by low, earnest, emphatic words, the diffidence of self yet without showing weakness.

The numerous vacancies, which had succeeded each other so quickly, too soon gave Carrington opportunities of piling up appointments, of which, with his laboriousness and his love of

exceeding tact and temper, led to his being elected very early to the honorable position of President of the West Kent Medico-Chirurgical Society; a very striking proof of the character of the man, and of the estimation in which he was held by his seniors.

work at Guy's, he was far too ready to avail himself. We believe that at one and the same time he held the appointments of Assistant Physician, with the Skin Department for his out-patients, Demonstrator of Pathology, Curator of the Museum, Joint Editor of the Reports, and the Subdean of our School. While the calamitous suddenness with which death had made gaps on the medical side makes it easy to explain, and to excuse this, there is no doubt that this adding toil to toil was most injudicious and harmful, and the result should point a warning to anyone in the future who may be tempted to act as a similar pluralist.

After about two years it was evident that the strain was telling upon him, and his energies becoming impaired; though Carrington was now only just entering on the prime of his manhood, the day was not far distant when his health would give way. Affectionate warnings were only met with the reply that at such and such a date he would drop some of his appointments, he was only waiting to get his work more in hand before it passed on to others, &c. The most that he could be persuaded to do was to give up his appointment at Greenwich; with everything else he struggled on, drawing still further on the balance of his strength, which had already sunk so low. Wearying and wearisome sleeplessness, which had pressed him hard in past years, now again beset him relentlessly. During the last year of his life it was noticed that he was increasingly worn and jaded, and that his passing smile, with which his quiet voice went so well, was not as of old times. He increasingly grew lacking in that elasticity of mind and body which alone can carry a man, wanting in an iron constitution, through such work as falls, nowadays, to the lot of those who are long juniors on a Hospital Staff. It is pleasant, however, to remember that as the evening of the days of this gentle companion set in it was not without its gleams. In 1886 Carrington was made F.R.C.P., an honour which was more to him than anything else in his life, save his appointment as Assistant Physician at Guy's. During this year also he was looking forward, as one whose thoughts had long been centred at Guy's, to the new relations with Guy's men, and the fresh opportunities of helping them, which the prospect of his becoming Dean in 1887 opened up. It is

certain that in the hands of one of such devoted loyalty to his hospital, and who had already given abundant proofs of his readiness to devote himself heart and soul to the interests and wellbeing of our students, this appointment would have proved a success, though it may be doubted if the wilder spirits, which are occasionally to be met with in our midst, might not have taken advantage of Carrington's notorious antipathy to anything like a resort to the *argumentum a baculo*. Another prospect in the beginning of 1887 brightened his life, viz. his moving into a much larger and better house in St. Thomas's Street. *Diis aliter visum est*. On the 11th of March Carrington was exposed to wet, and the next day had a slight rigor. On the 12th (a Saturday) a case of obscure blood-poisoning, thought to be glanders, died in Clinical Ward. As by waiting till Monday valuable time would have been lost in making the inspection, Carrington, as ever unflinching from labour, and to the very last not to be turned away from what seemed to him a simple discharge of duty, made the post-mortem examination on the morning of the 13th. The chilliness of the theatre, as was only too natural on a Sunday in March, hastened the mischief which was ripening within him. On Monday, the 14th, Dr. F. Taylor found evidence of pleuro-pneumonia on the left side; on the 15th the opposite side became implicated, then followed harmless, quiet delirium, not unworthy of the closing life. The disease gathered head rapidly, and with strength overtaxed, and with no reserve of vitality to fall back upon, early on the morning of Wednesday the 16th, Carrington, taking Death easier than life, *a laboribus requievit*. Ere the coffin lid darkened the dead man's face, Death, the greatest of all sculptors, had obliterated from his features much of the traces of all the later toilful period of Carrington's life, replacing them with those placid, sunny traits which were so familiar a few years before. On the 19th troops of friends were present when his body was laid in Norwood Cemetery. The site of the grave is well chosen; Carrington sleeps on the same hillside, and close to the remains of one of his teachers, whom he had always loved to honour, and of whose acumen, sagacity, and accuracy he was a great admirer, Dr. Fagge. As was most fitting, the students were not long in placing over his resting

place a fair stone, a seemly tribute of affection to one who had loved them so well.

Having given a sketch of the brief career of Carrington, we shall endeavour to sum up his character, trusting that we shall have shown what manner of man he was, while we are only too sensible of the imperfect justice that we have done him.

In him were singularly combined the spirit of charity (rare in every age), a profound humility (especially rare at the present day), which played softly over every day of his life, great simplicity of character, tender domestic affection;[1] unwillingness to think evil of any, even of those of whose conduct he disapproved, habitual consideration for the welfare and interests of others, and a most consistent shrinking from anything like self-assertion, self-interest, and show.

We believe that the influence which Carrington commanded was mainly due to the conviction which he produced that singleness of purpose, conscientious devotion to duty, subordination of all personal considerations to the advancement of his fellow-men and of his hospital, were the great objects on which his heart was set.

In taking leave of this gentle companion, whose memory lives so green in the hearts of many, we may conclude by applying to him the self-commendation of Pope.

> "With eyes that pry not, tongue that ne'er repeats,
> Fond to spread friendships, but to cover heats;
> To help who want, to forward who excel,
> This all who know me know, who love me tell."

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[1] This calls for an allusion to Carrington's exceeding gentleness and consistent zeal in the good treatment of some minor members of his household, viz. his dogs. In his tenderness, sympathy, and friendship for these, he habitually acted as if practising the Mohammedan precept, which some of my readers may remember that the late author of 'Friends in Council' quoted from the Koran:—"There is no kind of beast on earth, nor fowl which flieth with its wings, but the same is a people like unto you; we have not omitted anything in the Book of our Decrees: then unto their Lords shall they return."

W. H. A. Jacobson.

SIXTH REPORT

OF THE

GUY'S HOSPITAL LYING-IN CHARITY,

FROM OCTOBER 1, 1875, TO SEPTEMBER 30, 1885.

COLLATED FROM THE RECORDS

By P. HORROCKS, M.D.

PRESENTED

By A. L. GALABIN, M.D., and P. HORROCKS, M.D.

Introduction.

This report extends over a period of ten years. The last report was for twelve years, but when the present paper was begun another twelve years had not elapsed, and it was thought better to give a decennial report which might be followed in future, in order that an easier comparison could be made.

The number of cases attended in each year has increased, being 25,489 for the ten years compared with 23,591 for the twelve preceding years, or 2,548 per annum instead of 1,966.

Many alterations have been made in the plan adopted, though some Tables have been drawn up on the same lines as in former reports for the sake of comparison.

An analysis of births has been made in order that it may be easily seen in what way the facts have been dealt with; such an analysis has not been given before, and it is very difficult and at times impossible to discover how some of the Tables in previous reports have been calculated. Thus in the present report a distinction has been drawn between viable and non-viable children, the former including all those born

at full time, or born prematurely but subsequent to the end of the sixth month of fœtal life, and the latter including those born before having attained that period of gestation.

Analysis of Births.

Confinements:			
Women attended			25,489
Births:			
25,201 women attended.—Single births	25,201		
279 „ „ Dual „	558		
6 „ „ Triple „	18		
3 „ „ Undelivered	—		
25,489			25,777
Condition at birth:			
Viable children.—Living (96·16 per cent.)	24,640		
„ „ Stillborn (3·84 „)	983		
	25,623		
„ „ Undescribed	13		
		25,636	
Non-viable children.—Living (few minutes to several hours)	17		
„ „ Stillborn	124		
		141	
			25,777
Sex:			
Viable children.—Males	13,520		
„ „ Females	12,097		
As 100 to 89	25,617		
„ „ Undescribed	19		
		25,636	
Non-viable children.—Males	56		
„ „ Females	34		
„ „ Undescribed	51		
		141	
			25,777
Presentation:			
Viable children with presentation given:			
Vide Table I.—Living	24,582		
„ „ II.—Stillborn	972		
	25,554		
Viable children.—Undescribed	82		
		25,636	
Non-viable children.—With presentation	90		
„ „ Undescribed	51		
		141	
			25,777

TABLE I.—*Presentations under which Viable Living Children were born.*

Out of 24,582 of whom the sex is given, 12,941 were males and 11,641 females, or as 100 to 90.

Presentation.	Males.		Females.		Total.	Per cent.
Vertex . . .	12,622	...	11,316	...	23,938 =	97·38
Vertex and hand .	36	...	20	...	56 =	·23
Breech . .	153	...	178	...	331 =	1·34
Foot . . .	60	...	72	...	132 =	·54
Face . . .	41	...	32	...	73 =	·30
Upper extremity .	7	...	5	...	12 =	·05
Transverse . .	2	...	7	...	9 =	·04
Brow . . .	8	...	4	...	12 =	·05
Funis . . .	12	...	7	...	19 =	·07
	12,941		11,641		24,582	

TABLE II.—*Presentations under which Viable Stillborn Children were delivered.*

Of these, 547 were males and 425 females, or as 100 to 78.

Presentation.	Condition.	Males.		Condition.	Females.		Total.	Per cent.
Vertex	Full term . 326 Decomposed . 3 Premature . 38	367	Full term . 246 Decomposed . 6 Premature . 33	285	...	652 =	67·1
Vertex and hand	Full term . 5 Premature . 1	6	Full term . 4 Premature . 1	5	...	11 =	1·1
Breech	Full term . 57 Decomposed . 1 Premature . 8	66	Full term . 62 Decomposed . 2 Premature . 3	67	...	133 =	13·7
Foot	Full term . 44 Decomposed . 1 Premature . 13	58	Full term . 30 Decomposed . 0 Premature . 4	34	...	92 =	9·5
Face	. 4		. . . .	3	...	7 =	·7
Upper extremity	Full term . 15 Premature . 1	16	Full term . 7 Premature . 0	7	...	23 =	2·4
Transverse . . .	. 7		. . . .	1	...	8 =	·8
Brow	. 2		. . . .	0	...	2 =	·2
Funis	With vertex . 12 „ breech . 2 „ foot . 1 „ arm . 5 „ transverse 1	21	With vertex . 12 „ breech . 1 „ foot . 6 „ arm . 3 „ transverse 1	23	...	44 =	4·5
		547		425		972	

TABLE III.—*Showing the proportionate number of the several presentations for the whole number of Viable Children, and the percentage of such Children stillborn under each presentation.*

Presentations.		Per cent.		Percentage stillborn.
Vertex . .	24,590 =	96·22	— ...	2·7 = 1 in 37·7
Vertex and hand .	67 =	·26 =	1 in 381 ..	16·4 = 1 in 6·1
Breech . .	464 =	1·82 =	1 in 55 ...	28·7 = 1 in 3·5
Foot or knee .	224 =	·88 =	1 in 114 ...	41·1 = 1 in 2·4
Face . . .	80 =	·31 =	1 in 319 ...	8·7 = 1 in 11·4
Upper extremity .	35 =	·14 =	1 in 730 ...	65·7 = 1 in 1·5
Transverse . .	17 =	·07 =	1 in 1503 ...	47·0 = 1 in 2·1
Brow . . .	14 =	·05 =	1 in 1825 ...	14·3 = 1 in 7
Funis . . .	63 =	·25 =	1 in 406 ...	69·8 = 1 in 1·4
	25,554 =	100·00		

The death-rate in the viable children in the present report is 3·84 per cent. In the last report the death-rate in children was 4·08, in the last but one 4·6, and in the preceding twenty-one years it was 5·2 per cent.

In connection with this great improvement, it is interesting to note the greatly increased use of the forceps. Not only have they been used twice as often as in the last series, but recourse has been had to their use at an earlier period of the delayed labour, and thus the children have had a better chance.

The mortality of upper extremity presentations has been apparently reduced, but a careful examination will show that in the last report many funis presentations were included under the heading of upper extremity, as well as under that of funis, if, as sometimes happened, the funis presented, and subsequently the arm came down. The same is true also of the transverse cases. But in the present report the cases have not been reckoned twice over in that way, and hence the percentages in Table III are seen to be exactly 100 on addition.

Taking foot and breech presentations together, the children stillborn are in the proportion of 1 in 3. In the last report the proportion was 1 in 2·5, and in the last but one 1 in 2·7.

Twin Cases.

Of twin cases there were 279, or about 1 in 91 of the whole number of women delivered, or about 1·09 per cent.

No. of cases.	Both males.	Both females,	One of each.
279	89	88	102

Presentations.

Vertex in both	125
„ and vertex with hand	6
„ and breech	72
„ and foot	36
„ and upper extremity	3
„ and transverse	2
„ and face	1
Breech in both	12
„ and foot	7
„ and upper extremity	1
Foot in both	8
Not given	6
	279

As in the last report, there does not appear to be any relation between the sex of the children and the fact of the amniotic cavity or placenta being double or single.

Case 1.—Both male. Single amniotic cavity and placenta.

Case 2.—Both male. Single amniotic cavity and placenta.

These are the only two cases where the amniotic cavity is recorded as single, and in the only two instances given in the last report, one (Case 5) was a case in which both children were females, and the other (Case 7) a case in which one was a male and the other a female.

Case 3.—Both male. Two amniotic cavities and a single placenta.

Case 4.—Both female. Two amniotic cavities and a single placenta.

Case 5.—Male and female. Two amniotic cavities and a single placenta.

Case 6.—Both male. Two amniotic cavities and a double placenta.

Case 7.—Both female. Two amniotic cavities and a double placenta.

Case 8.—Male and female. Two amniotic cavities and a double placenta.

Triplets.

No. of cases.	All males.	All females.	One male and two females.	Two males and one female.
6	1	3	1	1

Presentations.

Vertex, vertex, and vertex	2
„ „ and breech	1
„ breech, and foot	2
„ „ and transverse	1
	6

Out of 18 children, 4 were stillborn, a mortality of 22·2 per cent, or 1 in 4·5.

No instrumental aid was required in any of these cases, and in only one (third child in Case 1) was any help given.

Case 1.—The presentations were vertex, breech, and transverse respectively, and the two first were dead. Version was performed with the third, and the child was born alive.

Case 2.—The presentations were breech, vertex, and vertex respectively, and all the children were born alive.

Case 3.—The presentations were vertex, breech, and foot respectively, and the two last born children were dead.

Case 4.—The presentations were all vertex, and the children were alive, but they all died in twenty-four hours.

Case 5.—The presentations were all vertex, and all the children were alive.

Case 6.—The presentations were vertex, breech, and foot respectively, and all the children were alive.

The third case was a primipara; all the rest were multiparæ.

The average age of the women was 29·5 years. The eldest was thirty-five and the youngest twenty-seven.

Face Presentations.

No. of cases.	Living.	Dead.
80	73	7

Seventy-four of the cases were delivered by natural efforts, and of these 5 died; one of the five was an anencephalous

fœtus. In 6 cases instruments were used; the forceps in 4, and the cephalotribe in 2. All the children in the forceps cases were born alive, but one died within twenty-four hours; in two instances the forceps were removed after some traction had been made, and the cases were left to nature.

In both the cases where the cephalotribe was used the forceps had been tried in vain; in one of these two cases the fœtus was anencephalic.

Excluding the two anencephalic fœtuses, there were 5 deaths in 78 cases of face presentation, or 6·4 per cent.

Funis Presentations.

No. of cases.		Living.		Dead.
63	...	19	...	44

In the last report only 8 were living out of 62. Of the present series there were 36 vertex presentations, 16 breech or foot, 9 upper extremity, and 2 transverse. In 7 cases of which 4 were vertex, 1 transverse, 1 upper extremity, and 1 breech, the funis had ceased to pulsate before the arrival of assistance. In 16 cases version was performed; 11 podalic, 2 cephalic, and 3 not stated. In one case (podalic version) the child was alive; all the rest were stillborn. Forceps were applied in 8 cases, of which 6 were vertex and 2 upper extremity. In one of the vertex cases the child was saved, all the rest were dead.

The funis was replaced in several instances, and in 4 cases it remained in the uterus. Of these 4 cases, 3 were vertex and 1 upper extremity; this last case was stillborn, but the remaining 3 cases (vertex) were successful in saving the child. Craniotomy was performed in 4 cases.

Brow Presentations.

No. of cases.		Living.		Dead.
14	...	12	...	2

In 2 cases only was version performed, and in both instances the child was dead; in one of these cases the forceps were used

to the after-coming head. The forceps were used in one case, and the child was alive. Eleven cases were left to nature, and all were born alive, the presentation being converted into a face in some instances.

Special reports are given of two of the cases.

Case 1.—Æt. 24; primipara. Brow presenting, pains frequent and strong. Pulse 100. No advance being made for two hours, chloroform was given, and podalic version performed. The patient was now allowed to regain consciousness, and the pains returning, the body was soon born. The head, however, being delayed in the pelvis, chloroform was again administered, and the forceps applied. The child was extracted but was dead. The mother recovered easily.

Case 2.—Age not given; third confinement. The head was hitched at the brim, and the brow was presenting. No progress having been made for five hours, the forceps were applied, and a living child extracted. Mother and child did well.

In the last report there were 2 deaths out of 16 cases, and one of the deaths was after version. Hence it would appear that the child has a much better chance in brow presentation if left to nature or if forceps are used.

Presentation of the Upper Extremity and Transverse Presentations.

The upper extremity presented in 44 cases, and in 9 the funis was prolapsed. There were 19 transverse presentations, and in 2 the funis was prolapsed.

Taking the whole 63 cases together, 6 were completed by natural efforts, 4 by spontaneous evolution, all stillborn, one by spontaneous version (*vide* Case 14), and one case was delivered spontaneously, but by what method is not stated.

In 50 cases version was performed, 18 of the children were living, and 32 stillborn; all the mothers recovered except one. Podalic version was performed in 45 cases, and cephalic version in 3 cases. In 2 cases it is not stated which kind was performed, but in all probability they were cases of podalic version. In the 3 cephalic version cases, one child was living

and the other two children were dead. Of the whole 63 cases, 22 were living and 41 were dead.

On comparing the last report it will be seen that the number of cases of presentation of the upper extremity and transverse presentations has decreased. Moreover, the mortality amongst the children is very much less. One mother only died against two in the last report.

Details of some of the more interesting cases are given.

Case 1.—Æt. 21; second confinement. Membranes unruptured; right hand felt through them; pains short and of little effect. Membranes ruptured artificially; uterus then acted strongly, and the right shoulder was driven down. Chloroform was given and podalic version performed, the left foot being seized and brought down. It was two hours before the child could be extracted, and it was quite dead.

Case 2.—Æt. 29; had had 14 miscarriages and 4 children. After one child was born a second bag of membranes was felt, and the child was placed transversely. Version was performed with great ease by the combined method and the child was easily extracted alive.

Case 3.—Æt. 32; seventh confinement. Hand along with the funis in the vagina; cord cold and pulseless. Child's back directed to the mother's abdomen, and the head to the left side. An attempt at replacing the hand having failed, cephalic version was performed, so as to convert it into hand and head presentation. The uterus then contracted vigorously, and expelled a dead and decomposed child. The mother recovered.

Case 4.—Æt. 38; eleventh confinement. Right hand and left shoulder presenting; membranes had been ruptured for two hours. Under chloroform podalic version was performed, and the anæsthetic was then stopped, and the case left to nature. The body was expelled, but as the head was arrested, the forceps were applied; the child was quite dead when extracted. The mother easily recovered.

Case 5.—Æt. 29; fifth confinement; triplets. The first and second (head and breech presentations respectively) were stillborn. The third was transverse, and podalic version was required; this child was born alive. The mother recovered.

Case 6.—Æt. 23; second confinement. The elbow in the

vagina; the right shoulder in the brim of the pelvis; the head above the pubes. The child was spontaneously evolved, but there was a little difficulty with the head, and artificial respiration failed to bring the child back to life. The mother did well.

Case 7.—Æt. 27; fifth confinement. Left shoulder was presenting, and the hand was outside the vulva. There were no pains. Version was performed by the senior assistant without an anæsthetic, and great difficulty was experienced; it took more than an hour, but the child was born alive and was much bruised. The bruises subsequently disappeared, but the child died in a week from convulsions.

Case 8.—Æt. 20; primipara. Very small woman, with a narrow pelvis. The head was arrested at the brim. The long forceps were applied, but the head could not be extracted. Dr. Galabin then tried his axis-traction forceps, also without success. Podalic version was performed under chloroform, and a dead child was born; the delivery of the head caused much trouble, and the perinæum was ruptured considerably; some stitches were put in. On the fourth day the mother's temperature had risen to 106° F., although she had been syringed out frequently with carbolic lotion. On the fifth day she was wildly maniacal. She soon improved and made a good recovery.

Case 9.—Fifth confinement; membranes unruptured. The head was distinctly felt in the left iliac fossa, and the breech over to the right side. No presentation could be made out. Dr. Horrocks having been sent for, performed cephalic version, and then ruptured the membranes. As the pains did not come on, the long forceps were applied, and a living child extracted. Mother and child did well.

Case 10.—Æt. 33; seventh confinement. Right shoulder and arm presenting; version performed under an anæsthetic; a dead child extracted. The uterus seemed very big after the placenta was born, and this was found to be due to a fibromyoma in its walls. There was no excessive post-partum hæmorrhage, but the patient had previously suffered for some years from menorrhagia.

Case 11.—Æt. 25; third confinement. The right hand was found low down in the vagina; a little higher up the left hand

and the funis were felt. The head was in the right iliac fossa, the abdomen of the child directed anteriorly. The uterus was in a state of tonic contraction which chloroform in no way diminished. A piece of string was tied round the right leg after it had been brought down, and a piece also was tied round the right arm. After a great deal of traction the right leg was born, and the right arm was prevented from slipping over the head by traction on the string attached. There was not much post-partum hæmorrhage, but the patient was very ill for a week with a high temperature and symptoms of peritonitis. Ultimately she recovered.

Case 12.—Æt. 30; second confinement. No presentation could be made out. Chloroform was given. The os was not dilated, and the child was found to be in a transverse position. The fingers and then Barnes's bags were used, and after two hours the legs were delivered. The patient was now allowed to regain consciousness, and the uterine pains then returned and the child was expelled alive. It only lived twenty-two hours. The mother recovered.

Case 13.—Æt. 21; primipara. Twins, the first born normally. The second presented transversely. Version was performed under chloroform and the leg drawn through the os. It was now left to nature, and uterine pains were promoted by external kneading. The child was at last born, and though rather blue was brought round by artificial respiration. Mother and child did well.

Case 14.—Æt. 25; fourth confinement. The lower ribs and the iliac spine on the left side could be felt presenting. The child was ultimately born breech first, and lived a quarter of an hour. The mother, who had had hæmorrhage for some weeks before the confinement, subsequently did well.

Forceps Cases.

Out of 25,636 births of viable children, protracted labour was terminated by forceps in 274, or 1 in 93, *i.e.* about 1·07 per cent.

In the last report, out of 23,591 women attended, 121 protracted labours were terminated by forceps, or 1 in 197, or

0·51 per cent. It will thus be seen that the forceps have been used in the present series of cases more than twice as often as in the preceding series; it must be remembered, however, that this report includes the cases of forceps used for accidental hæmorrhage, and for eclampsia; they were omitted in the last report.

This increased use of the forceps has undoubtedly saved many mothers from a great deal of pain, reduced the mortality amongst the children, and probably also amongst the mothers; it has not diminished the number of craniotomy cases, so that it will be seen that the forceps have been used more frequently in cases of uterine inertia and slight obstruction, which might, perhaps, have been terminated by natural efforts alone if left long enough.

Out of the 274 forceps cases, eleven of the mothers died; 6 from septicæmia, 3 from hæmorrhage, 1 from bronchitis, and 1 from heart disease. The mortality was therefore 4 per cent. In the last report it was practically the same (5 out of 121).

Of the 274 children, 237 were living, 36 dead, and 1 undescribed. They were made up as follows:

Males living	141	237
Females living	95	
Undescribed living	1	
Males dead	25	36
Females dead	11	
No information	1	1
	274	274

Excluding the child about which no information is given, we have 36 dead out of 273, a mortality of 13·18 per cent., or 1 in 7·6 (nearly). Excluding the one whose sex is undescribed, and the other about which no information is given, we have 25 males dead out of 166 cases, a mortality of 15·06 per cent., or 1 in 6·6, whilst we have 11 females dead out of 106, a mortality of 10·37 per cent., or 1 in 9·6. Thus it will be seen that males, confirming previous observations, stand a worse chance of being extracted alive than females. In the last report the general infantile mortality in the forceps cases was 24 per cent. (nearly), the male infant mortality 30 per cent. (nearly),

and the female infant mortality 15 per cent. (nearly). This shows that an apparently great improvement has been made, but, as before mentioned, it must be remembered that many in the present series have been assisted by the forceps, which were left to nature in the last series; at the same time, the fact that the mortality is so largely diminished, shows that the increased use of the forceps in such cases does not add any dangers to the mother or child.

In most of the cases the long curved forceps (Dr. Barnes's pattern) have been used, both in the low and high operations; for it has been found that the long forceps are quite as good in the low operation as the short forceps, at least in the great majority of cases. In two cases axis-traction forceps were used; in one (Case 43) they were used alone, but in the other (Case 125) the ordinary long forceps had first been tried in vain; in the latter case the child was born alive, whilst in the former the child was dead. In two other cases the long forceps were first tried and then the axis-traction forceps; but both having failed, version was performed successfully, one of the children being stillborn, and the other living for two days. In five cases, after the failure of forceps, version failed to deliver, and craniotomy of the after-coming head was required; in two of these cases cephalotripsy was also necessary, both mothers recovering; in the remaining three cases, much traction was made, and one of the mothers died with symptoms of rupture of the uterus; the other two mothers recovered. Where much traction is necessary, after craniotomy has been performed, it is generally best to perform cephalotripsy and so save the maternal tissues as much as possible.

In two cases forceps were applied to the after-coming head, *vide* special reports (page 34).

Forceps were used at the brim 92 times; 6 of the mothers died, and 18 of the children. Version was performed for various reasons when the head was at the brim in 33 cases, out of which 5 of the mothers and 29 of the children died, thus showing that the forceps give a much better chance to both mother and child than version; though it must be stated that in 10 of the version cases, forceps had been previously tried in vain.

A tabular statement of all the forceps cases is appended,

and after the Table, details are given of some of the more interesting and important.

The Table does not include those cases in which the forceps were tried first, and version or craniotomy was subsequently performed.

TABLE IV.—*Tabular Statement of Forceps Cases.*

No. of case.	Age.	Pregnancy.	Cause of interference.	Duration of labour in hours.	Duration of expulsive stage in hours.	Hours arrested.	Position in pelvis reached by head.	Long forceps.	Short forceps.	Children.				Mothers.		Remarks.
										Living.		Stillborn.		Recovered.	Died.	
										M.	F.	M.	F.			
1	41	10	Inertia; disproportion; occipito-posterior	34	...	...	At brim	1	...	...	...	1	...	1	...	Ruptured perinæum.
2	25	1	Arrested internal rotation	42	...	10	Low in cavity	1	...	...	1	...	...	1	...	Post-partum hæmorrhage.
3	24	1	Uterine inertia	...	...	9	On perinæum	...	...	...	1	...	...	1	...	Slightly ruptured perinæum.
4	26	1	Feebleness of patient	...	...	6	Low in cavity	...	...	1	...	...	...	1	...	Slightly ruptured perinæum.
5	23	1	Uterine inertia	...	7	...	In cavity	1	...	1	...	...	...	1	...	Slightly ruptured perinæum; post-partum hæmorrhage.
6	27	3	Not given	...	8	...	At brim	1	...	...	1	...	...	1		
7	21	1	Head capped by anterior lip of os, and soft parts swollen	...	6	...	Low in cavity	...	...	...	1	...	...	1	...	Ruptured perinæum.
8	18	1	Disproportion	...	...	...	In cavity	...	...	1	...	...	...	1		
9	40	11	Swollen cervix	...	...	4	At brim	1	...	...	1	...	...	1		
10	18	1	Feeble pains	...	24	...	„	1	...	...	1	...	...	1		
11	25	1	Exhaustion	...	...	...	Not given	...	...	...	1	...	...	1	...	Ruptured perinæum.
12	20	1	Rigid os	72	...	...	At brim	1	...	1	...	...	...	1		
13	21	1	„	26	...	...	„	1	...	1	...	...	...	1	...	Slight post-partum hæmorrhage.
14	29	1	Disproportion	21	...	...	„	1	...	1	...	...	...	1	...	Slightly ruptured perinæum.
15	23	3	Occipito-posterior; inertia	8	...	4	Not given	...	...	...	1	...	...	1	...	Admitted to hospital for pelvic cellulitis.
16	25	2	Occipito-posterior	24	...	...	At brim	1	...	...	...	1	...	1		
17	37	1	Rigid os	25	...	...	In cavity	1	...	...	...	1	...	1	...	Chloroform; ruptured perinæum.
18	20	1	Not given	...	...	...	Low in cavity	...	...	...	1	...	...	1		
19	24	4	Rigid os	10	...	...	At brim	1	...	...	1	...	...	1	...	Ante-partum hæmorrhage.

TABLE IV (*continued*).

No. of case.	Age.	Pregnancy.	Cause of interference.	Duration of labour in hours.	Duration of expulsive stage in hours.	Hours arrested.	Position in pelvis reached by head.	Long forceps.	Short forceps.	Children. Living. M.	Children. Living. F.	Children. Stillborn. M.	Children. Stillborn. F.	Mothers. Recovered.	Mothers. Died.	Remarks.
20	27	4	Contracted pelvis	...	...	4	At brim	1	...	...	1	...	...	1	...	Conjugate less than four inches.
21	33	2	„	...	...	3	„	1	...	1	...	...	...	1	...	Contracted conjugate.
22	22	2	Not given	...	...	...	Low in cavity	1	...	...	1	...	...	1		
23	20	1	Inertia	...	15	...	At brim	1	...	...	...	...	1	1		
24	21	1	„	72	13	...	Low in cavity	...	...	1	...	...	...	1	...	Chloroform; child had slight facial paralysis.
25	26	5	Arrested at outlet	12	6	...	„	...	...	...	1	...	...	1		
26	22	1	Inertia; rigid perinæum	120	48	...	„	...	...	...	1	...	...	1	...	Post-partum hæmorrhage. Perchloride of iron injected. Ruptured perinæum.
27	20	1	Arrested at outlet	24	8	...	Low in cavity	...	...	...	1	...	...	...	1	Pneumonia and septicæmia.
28	28	7	Prolapse of funis	...	...	...	At brim	1	...	...	...	1	...	1	...	Chloroform.
29	35	7	Contracted pelvis; exhaustion	34	3	...	„	1	...	1	...	...	...	1		
30	26	1	Syphilitic atresia of vulva	...	...	...	Low in cavity	1	...	Not given				1	...	Chloroform; ruptured perinæum.
31	31	3	Contracted pelvis	20	10	...	At brim	1	...	1	...	...	...	1	...	Chloroform; contracted conjugate.
32	39	1	Rigid perinæum; exhaustion	44	16	...	Low in cavity	1	...	1	...	...	...	1	...	Chloroform; ruptured perinæum.
33	25	1	Arrested at outlet	...	10	...	„	1	...	1	...	...	...	1	...	Ruptured perinæum.
34	26	2	Twins, distended abdomen; occipito-posterior	30	18	...	In cavity	1	...	...	...	1	...	1	...	Perforation of fœtal abdomen necessary in delivery. Twin.
35	32	7	Bronchitis; exhaustion	...	5	...	At brim	1	...	...	...	1	...	1		
36	20	1	Protracted labour	...	10	...	Low in cavity	...	...	...	1	...	...	1		
37	28	1	„	36	14	...	„	...	...	1	...	...	...	1	...	Chloroform; post-partum hæmorrhage.
38	27	5	Face presentation	36	...	...	In cavity	...	...	1	...	...	...	1	...	Chloroform.
39	18	1	Protracted labour	...	9	5	Low in cavity	...	...	...	...	1	...	1	...	Chloroform.
40	23	1	„	24	10	...	„	...	...	1	...	...	...	1	...	Ruptured perinæum.
41	32	6	disproport-	11	...	...	„	...	...	1	...	...	...	1	...	Chloroform.

[illegible]	[illegible]	[illegible]	Not given . . .	...	...	...	Low in cavity	...	1	1	...	...	...	1		
45	22	4	„ . . .	...	...	...	„	...	1	1	...	...	...	1		
46	33	7	Anteversion; protracted labour	...	192	...	At brim	1	...	1	...	...	...	1	...	Chloroform.
47	25	1	Not given . . .	...	...	...	Low in cavity	...	1	1	...	...	...	1		
48	28	3	„ . . .	...	...	...	Not given	...	...	1	...	...	...	1	...	Post-partum hæmorrhage.
49	22	1	Protracted labour .	...	...	7	Low in cavity	1	...	...	1	...	...	1	...	Ruptured perinæum; post-partum hæmorrhage. Perchloride of iron injected.
50	30	4	„ .	12	4	...	In cavity	1	Sex not given, living					1	...	
51	20	1	„ dependent anterior lip of os	...	6	...	Low in cavity	1	...	1	...	...	...	1	...	Chloroform; slightly ruptured perinæum.
52	34	10	Protracted labour; inertia	...	6	...	„	...	...	1	...	...	...	1		
53	20	2	„ exhaustion	...	6	...	At brim	1	...	1	...	...	...	1	...	Patient had smallpox. Twin; post-partum hæmorrhage.
54	25	5	Contracted pelvis .	...	30	...	„	1	...	1	...	...	...	1	...	Contracted conjugate; previous labours tedious.
55	38	7	.	...	4	...	„	1	...	...	1	...	...	1	...	Contracted conjugate; previous labours instrumental.
56	33	7	.	48	30	...	„	1	...	1	...	...	...	1	...	All previous children stillborn; instrumental labours; transverse contraction.
57	34	7	Uterine inertia . .	40	20	...	„	1	...	1	...	...	...	1		
58	38	7	Protracted labour .	20	...	3	Low in cavity	...	...	...	1	...	...	1		
59	20	1	Uterine inertia . .	...	6	...	„	...	...	1	...	...	...	1	...	Ruptured perinæum.
60	28	2	Protracted labour .	...	...	...	„	1	...	1	...	...	...	1	...	Forceps with first child.
61	36	5	„ . .	12	...	4	At brim	1	...	1	...	...	...	1	...	Forceps twice before.
62	30	5	Exhaustion . .	18	5	...	„	1	...	1	...	...	...	1	...	Galabin's forceps used; forceps once before.
63	23	2	Uterine inertia . .	...	...	2	„	1	...	...	...	...	1	1	...	Twin; second child; first born alive.
64	21	1	Protracted labour .	18	...	...	Low in cavity	1	...	...	1	...	...	1	...	Slightly ruptured perinæum; funis round neck.
65	40	11	Uterine inertia . .	...	...	...	At brim	1	...	1	...	...	...	1	...	Forceps with first child.
66	24	1	Exhaustion . .	6	...	...	Low in cavity	1	...	1	...	...	...	1	...	Post-partum hæmorrhage.
67	20	1	„ uterine inertia .	...	6	...	„	1	...	...	1	...	...	1	...	Slightly ruptured perinæum; post-partum hæmorrhage.
68	41	9	Protracted labour .	...	3	...	In cavity	1	...	...	1	...	...	1	...	Forceps with first child.

TABLE IV (*continued*).

No. of case.	Age.	Pregnancy.	Cause of interference.	Duration of labour in hours.	Duration of expulsive stage in hours.	Hours arrested.	Position in pelvis reached by head.	Long forceps.	Short forceps.	Children. Living. M.	Children. Living. F.	Children. Stillborn. M.	Children. Stillborn. F.	Mothers. Recovered.	Mothers. Died.	Remarks.
69	26	1	Contracted pelvis	...	6	...	In cavity	1	...	1	...	...	...	1	...	Contracted pelvic outlet?
70	28	3	Contracted labour; prolapse of funis	24	...	...	At brim	1	...	...	...	1	...	1	...	Funis presentation.
71	25	1	Not given	...	...	...	Not given	...	...	...	1	...	...	1		
72	20	1	Contracted pelvis	...	...	...	„	...	...	1	...	...	...	1		
73	30	5	Protracted labour	...	6	...	In cavity	...	...	1	...	...	...	1		
74	40	4	Not given	...	...	...	Not given	...	...	1	...	...	...	1		
75	37	8	„	...	...	...	„	...	...	1	...	...	...	1		
76	20	1	Protracted labour	...	...	4	Low in cavity	...	1	...	1	...	...	1		
77	28	1	„	...	...	5	„	...	1	1	...	...	...	1	...	Ruptured perinæum.
78	28	9	Not given	...	...	...	Not given	...	...	1	...	...	...	1		
79	37	11	Hæmorrhage; exhaustion; inertia; occipito-posterior	11	4	...	Low in cavity	...	...	...	...	1	...	...	1	Internal hæmorrhage? No P.M.
80	30	9	Uterine inertia	...	...	2	„	...	...	...	1	...	...	1	...	Severe post-partum hæmorrhage; perchloride of iron injected; flooding with all her confinements.
81	36	10	Exhaustion; inertia	...	...	...	„	...	1	1	...	...	...	1	...	Severe post-partum hæmorrhage; perchloride of iron injected.
82	20	1	Eclampsia	4	...	...	„	...	...	...	1	...	...	1	...	Albuminuria; chloroform.
83	24	4	Occipito-posterior	12	...	...	At brim	1	...	1	...	...	...	1		
84	29	6	Head capped by anterior lip of os, and soft parts swollen	...	6	...	Low in cavity	1	...	1	...	...	...	1		
85	19	1	Occipito-posterior	36	...	...	At brim	1	...	1	...	...	...	1	...	Chloroform; ruptured perinæum; Barnes's bags used.
87	35	8	„ eclampsia	...	...	...	At brim	1	...	1	...	...	...	1	...	Chloroform; slightly ruptured perinæum.

90	30	1	„ . . .	...	...	...	Low in cavity	...	1	...	...	1	...	1			
91	26	3	Uterine inertia . .	16	5	...	At brim	1	...	...	...	1	...	...	1	Slight post-partum hæmorrhage; some ante-partum hæmorrhage.	
92	31	6	Not given . . .	...	...	...	Not given	...	...	...	1	...	...	1	...	Twin.	
93	31	7	Protracted labour .	24	...	...	In cavity	1	...	1	...	...	...	1			
94	47	8	Chronic bronchitis .	...	...	...	Not given	...	...	...	1	...	...	1			
95	25	2	Not given . . .	...	...	...	„	...	...	1	...	...	...	1			
96	35	4	Placenta prævia . .	...	...	...	„	...	...	1	...	...	...	1			
97	24	3	Not given . . .	...	...	...	At brim	1	...	1	...	...	...	1			
98	34	1	„ . . .	...	...	...	„	1	...	1	...	...	...	1			
99	35	8	Acute bronchitis .	12	...	...	„	1	...	...	1	...	...	...	1	Premature; Barnes's bags used.	
100	41	12	Uterine inertia . .	...	8	...	Low in cavity	...	...	1	...	...	...	1			
101	21	1	Not given . . .	...	...	...	Not given	...	1	...	...	...	1	1			
102	30	8	„ . . .	...	...	...	„	1	...	...	1	...	...	1			
103	18	1	Protracted labour; inertia .	28	7	...	Low in cavity	...	1	1	...	...	...	1			
104	22	2	„ . .	26	2	...	„	...	1	...	1	...	...	1			
105	35	5	„ . .	24	...	...	At brim	1	...	...	1	...	...	1			
106	36	1	Occipito-posterior .	...	...	...	Low in cavity	...	1	...	...	1	...	1			
107	25	1	Protracted labour .	48	...	...	At brim	1	...	1	...	...	...	1			
108	20	1	Not given . . .	...	...	...	Not given	1	...	1	...	...	...	1			
109	28	1	Protracted labour; occipito-posterior	20	...	...	In cavity	...	1	...	1	...	...	1	...	Post-partum hæmorrhage.	
110	21	1	„ .	20	...	...	Low in cavity	...	1	...	1	...	...	1	..	Post-partum hæmorrhage.	
111	20	1	„ . .	...	...	...	„	...	1	...	1	...	...	1	...	Ruptured perinæum.	
112	46	11	„ occipito-posterior	15	...	...	„	...	1	1	...	...	...	1			
113	30	1	„ exhaustion	...	...	...	„	...	...	1	...	...	...	...	1		
114	20	1	„ . .	...	...	...	„	...	1	...	1	...	...	1	...	Ruptured perinæum.	
115	18	1	Contracted pelvis . .	...	...	...	At brim	1	...	...	1	...	...	1			
116	26	1	Uterine inertia . .	33	...	...	„	1	...	1	...	...	...	1	...	Slightly ruptured perinæum.	
117	21	1	Protracted labour; large head; disproportion	24	...	...	Low in cavity	...	...	1	...	...	...	1	...	Ruptured perinæum; post-partum hæmorrhage.	
118	20	1	Not given . . .	...	...	...	Not given	...	1	1	...	...	...	1			
119	21	1	Exhaustion and excitement	...	12	...	At brim	1	...	...	...	1	...	1	...	Chloroform.	
120	39	13	Protracted labour; exhaustion	...	10	...	„	1	...	1	...	...	...	1			

TABLE IV (*continued*).

No. of case.	Age.	Pregnancy.	Cause of interference.	Duration of labour in hours.	Duration of expulsive stage in hours.	Hours arrested.	Position in pelvis reached by head.	Long forceps.	Short forceps.	Children.				Mothers.		Remarks.
										Living.		Stillborn.		Recovered.	Died.	
										M.	F.	M.	F.			
121	37	15	Uterine inertia . . .	...	...	...	At brim	1	...	...	1	...	...	1	...	Last of twins; slight post-partum hæmorrhage.
122	29	3	Contracted pelvis . .	...	...	...	Low in cavity	...	1	...	1	...	...	1		
123	26	1	Not given	...	...	...	Not given	...	...	1	...	...	...	1		
124	40	7	,, ...	...	...	...	,,	...	...	1	...	...	...	1		
125	26	4	Protracted labour; head capped by anterior lip of os, and soft parts swollen	...	12	...	At brim	1	...	...	1	...	...	1	...	Galabin's forceps after ordinary failed; chloroform.
126	24	1	Uterine inertia . . .	19	15	...	In cavity	...	...	...	1	...	...	1	...	Puerperal mania followed.
127	30	1	,, . . .	...	18	...	Low in cavity	...	...	...	1	...	...	1	...	Slightly ruptured perinæum.
128	24	3	,, . . .	...	6	...	,,	...	1	1	...	...	...	1		
129	20	3	,, . . .	...	14	...	At brim	1	...	1	...	...	...	1		
130	32	6	Pelvic deformity . .	...	24	...	,,	1	...	1	...	...	...	1	...	Imperfect sacral curve; forceps once before; only one child living.
131	40	6	Not given	...	...	...	Not given	1	...	...	...	1	...	1		
132	32	8	Uterine inertia . . .	...	5	...	Low in cavity	...	...	1	...	...	...	1		
133	18	1	,, . . .	...	...	...	,,	1	...	...	1	...	...	1		
134	24	1	,, . . .	...	...	4	,,	1	...	1	...	...	...	1		
135	27	4	,, . . .	...	...	3	,,	1	...	...	1	...	...	1		
136	18	2	Contracted pelvis . .	72	3	...	At brim	1	...	1	...	...	...	1	...	Contracted conjugate.
137	24	1	Uterine inertia . . .	...	8	...	In cavity	...	...	...	1	...	...	1	...	Ruptured perinæum; child lived 2 days; distended abdomen gave rise to difficult delivery of body.
138	27	1	Contracted pelvis . .	12	...	...	Low in cavity	...	1	...	1	...	...	1	...	Anchylosed coccyx; conjugate of outlet $2\frac{3}{4}$ inches.
139	17	1	Occipito-posterior . .	...	...	...	,,	...	1	...	...	1	...	1		
140	44	14	Uterine inertia . . .	36	12	...	,,	...	1	1	...	...	...	1		

																	ture of spine.
142	29	1	„ . . .	...	9	6	Low in cavity	...	1	...	1	...	...	1	...	Child lived 7 days.
143	35	7	Hand and funis with vertex	...	...	...	At brim	1	...	...	...	...	1	1	...	Chloroform.
144	30	5	Exhaustion . . .	...	21	...	Low in cavity	...	1	...	...	1	...	1	...	Ante-partum hæmorrhage and post-partum hæmorrhage.
145	23	4	Uterine inertia . . .	...	...	4	„	...	1	...	1	...	...	1	...	Ruptured perinæum; puerperal fever and mania.
146	41	14	Occipito-posterior . .	...	6	...	Low in cavity	...	1	1	...	...	...	1		
147	25	1	„ . .	72	...	...	„	...	1	1	...	...	...	1		
148	20	1	Rigid os	...	...	...	„	...	1	1	...	...	...	1	...	Os dilated digitally.
149	22	3	Protracted labour . .	17	12	...	„	...	1	...	1	...	...	1		
150	31	6	Occipito-posterior . .	...	...	12	At brim	1	...	1	...	...	...	1	...	Chloroform.
151	25	1	Uterine inertia . . .	...	10	...	In cavity	...	...	...	1	...	...	1		
152	19	1	„ . . .	50	12	...	„	...	...	1	...	...	...	1		
153	32	4	„ . . .	...	6	...	In cavity	...	...	1	...	...	...	1	...	Forceps on previous occasions.
154	27	4	„ . . .	18	...	...	At brim	1	...	1	...	...	...	1		
155	25	2	Rigid os; large head . .	...	12	...	„	1	...	...	1	...	...	1		
156	26	1	Protracted labour . .	...	...	2	Low in cavity	...	1	...	1	...	...	1		
157	18	1	Protracted labour; occipito-posterior	...	...	...	In cavity	...	...	1	...	...	...	1	...	Ruptured perinæum.
158	25	2	Uterine inertia; occipito-posterior	...	...	...	„	1	...	...	1	...	...	1	...	Ruptured perinæum.
159	35	6	Protracted labour; occipito-posterior	...	...	...	Low in cavity	...	...	...	1	...	...	1	...	
160	30	4	Uterine inertia . . .	...	...	...	„	...	...	...	1	...	...	1	...	Post-partum hæmorrhage; all labours instrumental.
161	36	7	Protracted labour; occipito-posterior	21	8	...	„	...	1	1	...	...	...	1	...	
162	24	2	Not given	...	...	...	Not given	...	...	1	...	...	...	1		
163	30	4	Protracted labour . .	12	...	3	Low in cavity	...	1	1	...	...	...	1	...	Rigid perinæum.
164	22	1	„ . . .	...	...	...	„	...	1	1	...	...	...	1	...	Rigid perinæum.
165	36	11	Uterine inertia; occipito-posterior	...	3	...	At brim	1	...	...	...	1	...	1	...	Fractured ribs from accident. Digital dilatation of os.
166	—	2	Not given	...	...	...	Not given	...	...	...	...	1	...	1	...	Chloroform.
167	27	2	„	...	...	...	„	...	1	...	1	...	...	1		
168	—	6	Protracted labour; prolapsed funis	...	...	...	„	1	...	...	...	...	1	1		

TABLE IV (*continued*).

No. of case.	Age.	Pregnancy.	Cause of interference.	Duration of labour in hours.	Duration of expulsive stage in hours.	Hours arrested.	Position in pelvis reached by head.	Long forceps.	Short forceps.	Children.				Mothers.		Remarks.
										Living.		Stillborn.		Recovered.	Died.	
										M.	F.	M.	F.			
169	32	5	Not given	...	...	...	Not given	...	1	1	...	...	...	1		
170	24	1	Protracted labour	...	...	...	Low in cavity	...	...	1	...	...	...	1	...	Ruptured perinæum; rigid perinæum.
171	20	1	„	20	...	...	„	...	...	...	...	1	...	1	...	Post-partum hæmorrhage; chloroform; cord twice round neck.
172	—	2	„	...	3	...	„	...	...	...	1	...	...	1		
173	—	2	Protracted labour; uterine inertia	...	...	...	At brim	1	...	1	...	...	...	1	...	Chloroform; ruptured perinæum; large head.
174	20	1	Protracted labour; uterine inertia	...	...	...	Low in cavity	...	...	1	...	...	...	1	...	Ruptured perinæum.
175	—	2	Not given	...	...	...	Not given	...	...	...	1	...	...	1		
176	30	5	„	...	...	...	„	...	...	1	...	...	...	1		
177	—	11	„	...	...	...	„	...	...	1	...	...	...	1	...	Ruptured perinæum.
178	29	2	Exhaustion	9	...	...	At brim	1	...	...	...	1	...	...	1	Ante-partum hæmorrhage; Barnes's bags.
179	21	1	Protracted labour	...	...	...	Not given	1	...	1	...	...	...	1		
180	19	1	„	...	...	...	„	1	...	1	...	...	...	1	...	Slightly ruptured perinæum.
181	—	8	Uterine inertia	...	...	...	„	1	...	...	1	...	...	1		
182	—	10	Not given	...	...	...	„	...	...	...	...	1	...	1	...	Twin.
183	41	10	Uterine inertia	...	...	...	„	...	1	...	1	...	...	1		
184	21	3	Not given	...	...	...	„	...	...	...	1	...	...	1		
185	19	2	Protracted labour	48	...	...	„	...	...	1	...	...	...	1		
186	29	4	Not given	...	...	...	„	...	...	1	...	...	...	1		
187	—	11	Occipito-posterior	...	...	...	„	...	...	1	...	...	...	1		
188	30	6	Not given	...	...	...	„	...	...	...	1	...	...	1		
189	20	1	„	...	...	...	„	...	...	1	...	...	...	1	...	Ruptured perinæum.
190	30	6	Protracted labour; occipito-posterior inertia	...	...	...	In cavity	...	...	...	1	...	...	1		
							Low in cavity	1		1				1		

195	30	2	„ . . .	...	...	...	In cavity	1	...	1	...	...	...	1	...	Rupture perinæum.
196	34	12	„ . . .	...	4	...	At brim	1	...	...	1	...	...	1		
197	25	3	Contracted pelvis . .	...	...	6	„	1	...	1	...	...	...	1	...	Contracted conjugate.
198	—	5	Face presentation . .	...	...	...	„	1	...	...	1	...	...	1		
199	43	7	Occipito-posterior . .	...	24	...	In cavity	...	...	1	...	...	...	1		
200	26	3	Protracted labour . .	...	10	...	At brim	1	...	1	...	...	...	1		
201	—	6	Face presentation . .	...	...	...	„	1	...	1	...	...	...	1		
202	32	3	Exhaustion . . .	...	...	4	In cavity	...	1	1	...	...	...	...	1	Lardaceous disease. Old hip-joint disease, suppurating.
203	32	3	Protracted labour . .	10	...	3	At brim	1	...	...	1	...	...	1	...	Chloroform.
204	—	3	Brow presentation . .	12	...	5	„	1	...	1	...	...	...	1		
205	35	8	Protracted labour; uterine inertia	...	9	...	Low in cavity	...	...	...	1	...	...	1		
206	27	1	Protracted labour; uterine inertia	42	...	...	„	...	...	1	...	...	...	...	1	
207	42	8	Protracted labour; uterine inertia	...	5	...	At brim	1	...	1	...	...	...	1		
208	37	11	Protracted labour . .	...	...	6	In cavity	...	...	1	...	...	...	1		
209	17	1	„ . .	18	...	...	At brim	1	...	...	...	...	1	1		
210	23	3	„ . .	...	...	...	Low in cavity	...	...	...	1	...	...	1		
211	31	3	„ . .	...	...	...	At brim	1	...	...	1	...	...	1	...	Tonic spasm of uterus.
212	36	8	Protracted labour; contracted pelvis	13	...	...	„	1	...	...	1	...	...	1	...	Contracted transverse.
213	40	11	Protracted labour; exhaustion	...	26	...	„	1	...	1	...	...	...	1		
214	22	1	Protracted labour; uterine inertia	...	22	...	In cavity	1	...	1	...	...	...	1	...	Rigid perinæum.
215	25	2	Protracted labour . .	...	5	3	„	1	...	...	1	...	...	1		
216	40	11	Rigid os	...	...	...	At brim	1	...	1	...	...	...	1	...	Barnes's bags used.
217	39	7	Protracted labour; exhaustion	30	...	...	„	1	...	1	...	...	...	1		
218	24	1	Not given	...	...	...	Not given	...	...	1	...	...	...	1		
219	28	5	„	...	...	...	„	...	...	...	...	1	...	1		
220	—	1	„	..	...	...	„	...	1	1	...	...	...	1		
221	22	1	„	...	...	...	„	...	1	1	...	...	...	1	...	Ruptured perinæum.

TABLE IV (*continued*).

No. of case.	Age.	Pregnancy.	Cause of interference.	Duration of labour in hours.	Duration of expulsive stage in hours.	Hours arrested.	Position in pelvis reached by head.	Long forceps.	Short forceps.	Children. Living. M.	Children. Living. F.	Children. Stillborn. M.	Children. Stillborn. F.	Mothers. Recovered.	Mothers. Died.	Remarks.
222	29	1	Not given	...	...	...	Not given	...	1	...	1	...	...	1		
223	22	1	„	...	...	...	„	...	1	...	1	...	...	1	...	Ruptured perinæum.
224	—	5	Protracted labour	...	...	8	In cavity	...	...	...	1	...	...	1		
225	40	11	Protracted labour; contracted pelvis	15	...	...	At brim	1	...	...	1	...	...	1	...	Contracted conjugate.
226	32	4	Protracted labour	...	...	...	Not given	...	...	...	1	...	...	1		
227	36	7	Not given	...	...	7	„	...	...	1	...	...	...	1		
228	34	1	Uterine inertia	24	...	8	At brim	1	...	...	1	...	...	1		
229	40	5	Hand with head presentation	...	...	...	„	1	...	...	...	1	...	1	...	Chloroform. Instruments at previous labours.
230	24	1	Protracted labour	...	6	...	In cavity	...	...	1	...	...	...	1	...	Ruptured perinæum.
231	39	6	„	...	...	6	At brim	1	...	1	...	...	...	1	...	Cervical elongation.
232	29	5	Contracted pelvis	24	10	...	„	1	...	1	...	...	...	1	...	Contracted conjugate.
233	21	1	Not given	...	...	...	Not given	...	...	...	1	...	...	1		
234	18	1	Protracted labour	48	...	...	Low in cavity	...	1	1	...	...	...	1	...	Contracted pelvic outlet; transverse diameter.
235	42	1	„	24	...	...	„	...	...	1	...	...	...	1	...	Ruptured perinæum.
236	33	6	Not given	...	...	...	Not given	...	1	...	1	...	...	1		
237	—	1	Protracted labour	...	...	...	„	...	1	1	...	...	...	1		
238	29	4	Not given	...	...	...	„	1	...	...	1	...	...	1		
239	27	2	„	...	...	...	„	...	...	1	...	...	...	1		
240	22	1	„	...	...	...	„	...	...	1	...	...	...	1		
241	33	7	Prolapsed funis	...	...	...	„	1	...	1	...	...	...	1		
242	24	1	Not given	...	...	...	„	...	...	1	...	...	...	1		
243	23	1	„	...	...	...	„	...	1	...	1	...	...	1		
244	22	1	Protracted labour	48	...	12	Low in cavity	...	...	...	1	...	...	1		

																	partum hæmorrhage.
248	25	2	Protracted labour	. .	16	...	5	In cavity	...	1	1	...	...	...	1		
249	43	10	Contracted pelvis	. .	...	...	...	Low in cavity	...	1	...	1	...	...	1	...	Contracted outlet, transverse.
250	18	1	Protracted labour	. .	...	...	8	In cavity	...	...	1	...	...	...	1		
251	—	7	Prolapsed funis	. . .	...	...	...	At brim	1	1	...	...	1	...	1	...	Post-partum hæmorrhage.
252	37	5	Contracted pelvis	. .	...	20	...	„	1	...	...	1	...	...	...	1	Contracted conjugate.
253	29	4	Rigid os	. . . .	36	...	...	„	1	...	1	...	...	...	...	1	Induction of labour previously; Barnes's bags.
254	33	9	Protracted labour	. .	24	17	...	„	1	...	...	...	1	...	1	...	Chloroform.
255	20	1	Rigid os	. . . .	38	...	...	„	1	...	1	...	...	...	1	...	Ruptured perinæum; Barnes's bags.
256	—	4	„	. . . .	...	5	...	„	1	...	1	...	...	...	1	...	Chloroform; Barnes's bags.
257	38	3	Protracted labour	. .	...	...	...	Not given	...	...	...	1	...	...	1		
258	—	5	„	. . .	...	...	...	At brim	1	...	...	1	...	...	1	...	Cephalic version.
259	27	5	Hæmorrhage; exhaustion	.	...	...	...	„	1	...	1	...	...	...	1	...	Ante-partum hæmorrhage; post-partum hæmorrhage; perchloride of iron injected.
260	—	1	Protracted labour	. .	...	...	...	Not given	...	1	1	...	...	...	1		
261	—	5	Uterine inertia	. . .	48	...	...	At brim	1	...	...	1	...	...	...	1	Hæmoptysis; cardiac disease; Barnes's bags.
262	25	5	Not given	. . . .	..	...	...	Not given	...	1	...	...	...	1	1		
263	27	2	Protracted labour	. .	...	...	4	At brim	1	...	1	...	...	...	1		
264	37	14	„	uterine inertia	24	...	...	Low in cavity	1	...	...	1	...	...	1		
265	27	1	„	. . .	...	12	...	„	1	...	...	1	...	...	1	...	Ruptured perinæum; adherent placenta.
266	—	5	„	. . .	28	10	...	At brim	1	...	1	...	...	...	1	...	Post-partum hæmorrhage.
267	24	1	Not given	. . . .	48	...	...	Not given	1	...	1	...	...	...	1	...	Ruptured perinæum.
268	21	1	Protracted labour	. .	...	72	...	Low in cavity	...	...	1	...	...	...	1		
269	28	8	„	exhaustion	24	...	...	At brim	1	...	...	1	...	...	1	...	Forceps in previous labours.
270	36	5	Rigid os	. . . .	...	288 (?)	...	„	1	...	...	...	...	1	1	...	Slight post-partum hæmorrhage; Barnes's bags.
271	33	1	Protracted labour	. .	...	...	6	Not given	...	...	1	...	...	...	1	...	Ruptured perinæum.
272	19	2	Rigid os	. . . .	72	...	...	At brim	1	...	1	...	...	...	1	...	Chloroform; digital dilatation.
273	22	2	Protracted labour; exhaustion		...	...	...	Low in cavity	...	...	...	...	...	1	1	...	Premature; 7th month.
274	27	2	Face presentation	. .	...	6	...	At brim	1	...	...	1	...	...	1	...	Child lived 24 hours.

Case 4.—Æt. 26; primipara. The patient was very feeble and unable to bear the pain. The head remained at the outlet for six hours without advancing. The pulse was quick, and so the forceps were applied. The perinæum was ruptured a little. The placenta was retained and had to be removed by passing the hand into the uterus. She subsequently had an offensive discharge and a high temperature (106° F.), but recovered slowly.

Case 13.—Æt. 21; primipara; rigid os; protracted labour. After waiting for more than twenty-four hours, Barnes's bags were used without success. Chloroform was then given, the cervix at once dilated, and the forceps were applied. Traction was made for an hour before delivery was accomplished.

This case is one of several where chloroform facilitated delivery by relaxing the cervix uteri when it was rigid apparently from spasm.

Case 30.—Æt. 26; primipara. Had previously been in the hospital with syphilis. It was doubtful whether she was married or not. The labia were swollen, thick, red and painful; and the vulva generally was so rigid that the head was prevented from emerging, although the pains were frequent and strong, and the head low in the pelvis. After trying the application of unguents and warmth, chloroform was given, and two incisions were made, one on each side of the fourchette; but still the head made no progress, so the long forceps were applied, and after considerable traction, a dead child was extracted, tearing the vulva up to the sphincter ani. Sutures were applied, but no union took place, and a nasty sloughy wound resulted. The mother ultimately recovered.

Case 34.—Æt. 26; second confinement. First child stillborn at seventh month; present confinement said to be also at seventh month. The head was at the brim; the left ear could be felt, and the cord was distinguished pulsating anteriorly. The head was in the transverse diameter of the brim. Seventeen hours after rupture of the membranes the head had made little advance, and Dr. Galabin, who now saw the case, found the brow presenting, and was able to feel the vertex of a second child. The forceps were applied but they slipped. They were now reapplied to a longer diameter of the fœtal skull; by traction the head was brought to the vulva;

the blades were removed and the head delivered occipito-posterior. The arms were folded behind the back, and in delivering them the humerus of one was fractured. The umbilical cord was twisted three times round the neck; it was tied, divided, and uncoiled. Considerable traction failing to deliver the body, chloroform was given, and a distended abdomen discovered as the cause of the difficulty. The thoracic walls and diaphragm were perforated, and a large quantity of fluid escaped. Some progress was now made, but, on examination through the opening in the diaphragm, the tense wall of a cyst was felt. This was perforated and more fluid escaped; the child was then extracted easily. The vertex of a second child was now felt, and it was soon born in a normal manner, though it was dead. The placenta was large but single. There were two separate cords, one of which divided into several where it entered the edge of the placenta. There was no history of syphilis.

The bladder of the first child was distended, but whether this was the "cyst" which is spoken of, the report does not make clear, though there is a note at the end which gives one the impression that it was the bladder.

Cases like the above are rare, but it is best to perforate through the thorax and diaphragm in order to reach the abdominal tumour and so deliver, otherwise there is considerable risk of rupture of the uterus.

Case 40.—Æt. 23; primipara. Labour pains began at 11 a.m. At 11 p.m. the os was the size of a shilling. Pains every twenty minutes, but weak. Later, the membranes ruptured. The os was fully dilated at 2 a.m., and an hour afterwards the head was on the perinæum. No further progress was made for seven hours; the pains become less frequent, the tongue dry, and so the forceps were applied, and a living child was extracted. The mother recovered easily.

Cases like the above occur occasionally, and there is no reason discoverable. The perinæum generally offers more resistance in a primipara than in a multipara; but at the same time, in the absence of some special cause, it is not obvious why in such a case labour should be so tedious. In private practice she would probably have been delivered many hours before, and that would have been better treatment perhaps.

The following is a similar case, where no reason was discovered, and she was a multipara.

Case 57.—Æt. 34; seventh confinement. The head was delayed at the brim for twenty hours, for which there was no apparent cause. The forceps were applied, and a living child was extracted. The patient made a somewhat slow recovery.

Case 42.—Æt. 31; fifth confinement. The forceps were applied in this case on account of ante-partum hæmorrhage, brought on by a fright and a fall from a window. The woman was trying to escape from her husband's violence. Rest, opium, and plugging having failed to stop the bleeding, the os was further dilated by means of Barnes's bags, and delivery speedily effected by the forceps. The child was only a little over seven months, and was born alive but died in a few days. Half an hour after the birth, post-partum hæmorrhage came on, and the patient became blanched and almost pulseless. Ice and ergot failed, so strong Tr. Ferri Perchloride was used and the bleeding stopped. Transfusion was discussed, but was not done. The mother ultimately recovered.

Perhaps rupture of the membranes would have been better treatment in the above case, but the facts are here given just as they are stated in the records. When properly done, plugging the cervix uteri with water dilators or other forms of dilators undoubtedly stops the bleeding, and then delivery can be effected by rupture of the membranes and the use of forceps.

Case 43.—Æt. 45; second confinement. Patient was thin and weak, and short in stature. Instruments had been tried with her first child, and it was eventually born dead. The patient was in labour several days. Finally, Barnes's bags were used, and Dr. Galabin applied a pair of axis-traction forceps of his own pattern. After a great deal of traction a stillborn child was delivered. The conjugate diameter of the pelvis was narrowed. The patient had some fever afterwards but recovered.

Case 46.—Æt. 33; seventh confinement. When first examined she had been in labour some time, and the membranes were ruptured. The extern felt what he thought was the child's head, and after more pains something showed itself externally, but it was the uterus. The os uteri was very high up, and directed to the promontory of the sacrum, and dilated

to the size of a florin. The patient was placed on her back, and a binder adjusted round the abdomen. The pains became weaker and finally ceased. Nothing was heard for a week, when she was again visited, and it was found that the pains had just come on again, but only slightly. The os was still high up but dilated. Chloroform was given and the forceps applied. A living male child was extracted, and the mother made an easy recovery.

This was an extreme case of ante-version, and the displacement was probably the cause of the dystocia. In other cases of anteversion the labour has been tedious. The head being driven towards the concavity of the sacrum, in fact, in a line directed backwards too much, descent is not so easily obtained. The same result with consequent tedious labour arises when the anterior lip is thick or elongated, as in the following case.

Case 64.—Æt. 21; primipara. When first seen the membranes had been ruptured twenty-four hours, the head was on the perinæum, the pains were strong and forcing, but no advance was made. The pains in the next few hours became weaker, and the pulse rose above 100. The long forceps were applied, and after considerable traction the head was delivered. The cord was found round the neck. It was drawn down and slipped over the head. After full delivery artificial respiration had to be employed, and other measures used before the child could be induced to breathe. The perinæum was ruptured a little, and one suture was put in. Mother and child subsequently did well.

In most cases when the cord is round the child's neck, labour is tedious, and the child's life in jeopardy. This is a very strong reason not only for applying the forceps when the head is delayed on the perinæum, but also for keeping the blades on until the head is fully delivered, instead of removing them when only part of the head is born, in order to save the perinæum, as is recommended by some authors. It is better in almost all cases to keep the blades on until the head is fully delivered.

Case 231.—Æt. 38; sixth confinement. At 8 a.m. the os was the size of half a crown, and the membranes intact. Three hours later the membranes ruptured. Six hours sub-

sequently the anterior lip of the os, much elongated and œdematous, was found projecting through the labia majora. The pains were violent and frequent, almost incessant; the head did not advance, but receded between the pains. An hour later the senior assistant applied the long forceps, but could not induce the head to advance. Dr. Horrocks then re-applied the forceps, and using considerable traction, delivered a living child. There was no hæmorrhage, and the patient made a good recovery.

This case is a type of a number of cases in which labour has been tedious, and in which the forceps have sometimes been employed. (*Vide* No. 51 in the Table.)

In other cases the labour has been tedious, but has been terminated by natural efforts. The cause of the delay is probably the same as in anteversion; the head is driven too far backwards, instead of in the proper axis, and hence much of the uterine force is wasted.

Case 70.—Æt. 28; third confinement. A large loop of pulsating cord was found to be presenting. The patient was placed in the knee-elbow position, and the funis was replaced, but came down again several times. Ultimately it stayed in the uterus, and the left (?) hand, which was felt by the side of the vertex, having been pushed upwards, the head was brought down by bimanual manipulation over the os, and the long forceps applied. The child was extracted dead after much force had been used.

In cases like the above, the chances for the child are much better if forceps are used than if version is employed. It is more than probable that in the above instance, not only was the cord compressed during the time that it was prolapsed, but even when it had apparently stayed in the uterus, a loop might easily get between the head and the brim during the considerable time that was occupied in making traction with the forceps.

Case 85.—Æt. 19; primipara. The patient had been in labour for more than twenty-four hours when the os was found the size of a shilling. Later, the cervix uteri was close to the perinæum, and the margins of the os thin. Barnes's bags were used, beginning with the smallest size. In two hours the os was fully dilated, and the pains were strong and

frequent, but no progress was made. It was discovered that the occiput was posterior. The forceps were applied and strong traction made for twenty minutes. The child was born alive, but the perinæum was severely lacerated. No sutures were put in, and she made a good recovery. Subsequently she was admitted into the hospital, and the perinæum was sewn up.

Cases of occipito-posterior are nearly always tedious, and whether the forceps are used or not, the perinæum is generally lacerated. Several instances will be found in the table.

Case 99.—Æt. 35; eighth confinement. Patient had suffered for years from bronchitis and emphysema. Three days ago during a fog she became very much worse, and developed symptoms of acute bronchitis. Although only eight months pregnant, labour set in. When first visited she was found in a very bad condition; extremities cold, face blue, sordes on lips, temperature 101° F., pulse 150, feeble, fine crepitation in the lungs, membranes unruptured, os admitting two fingers. Barnes's bags were used, commencing with the smallest. The forceps were applied as soon as the os was sufficiently dilated. A living child was extracted, though there was some difficulty in inducing it to breathe. The placenta was adherent, and had to be removed with the hand. Little blood was lost, but the operations lasted two and a quarter hours, reckoning from the commencement of the use of the water-bags. Shortly after the termination of labour, the woman sank into a state of collapse, in which she remained for twenty hours and then died. Ammonia, ether, senega, and brandy were tried in vain; brandy was injected subcutaneously.

In the above case, the patient was in such a grave condition from the bronchitis, that it was considered desirable to terminate labour as quickly as possible. This was done, but she never rallied, and would probably have died undelivered if she had not been assisted.

Case 125.—Æt. 26; fourth confinement. After being in labour some time, the membranes ruptured and the os dilated, but the anterior lip was œdematous, and the head was jammed above the pubes. The long forceps were applied easily, but traction in all directions failed. Dr. Galabin was sent for and he reapplied the forceps, and made considerable traction

without any effect. He then sent for a pair of axis-traction forceps designed by himself; he applied them, and by making powerful traction backwards the head slipped off the pubes, and a living child was born. Some difficulty was experienced in getting it to breathe, and its head was much bruised, but in a few days this was all right again. The mother was under chloroform an hour and a half, but made a good recovery.

The above is a very good example of cases in which axis-traction forceps are a great advantage. The ordinary long forceps can be so used as to be practically axis-traction forceps, but in a case like the above, where the head was above the pubes, traction was required in a line so far backwards in order to pull the head into the brim, that special axis-traction forceps were necessary.

Case 164.—Æt. 22; primipara. On examination the os was found to be fully dilated, the membranes ruptured, and the pains frequent but weak; pulse 120; vagina and perinæum rigid and dry. A quantity of lard was introduced into the vagina, and hot fomentations were applied to the perinæum, which still remained rigid. The forceps were applied, and a living child delivered without rupturing the perinæum.

Case 165.—Æt. 36; eleventh confinement. The patient had fractured her ribs through a fall two days previously. Hence she was unable to help herself by bearing down, and the uterine pains became feeble and infrequent. The membranes had already ruptured, and the os was not fully dilated. The fingers were used to dilate the os, and then the forceps were applied; traction was made for an hour before delivery was effected. The occiput was posterior; the child was dead; the mother made a good recovery.

The above is interesting, showing as it does how an injury like fracture of the ribs interferes with labour, for not only is the mother unable to use her muscles voluntarily, but owing to the pain produced there is a reflex inhibition of the uterine contractions. No doubt the occipito-posterior position of the vertex increased the difficulty.

Case 201.—Age not stated; sixth confinement; face presentation. The chin was posterior at first, but afterwards turned to one side. A good deal of traction was required, and

the forceps made a green-stick fracture of the frontal bone. The mother and child subsequently did well.

Case 235.—Æt. 42; primipara. The membranes ruptured on the 9th of January, and on the 11th the os was found to be well dilated, and the head in the upper part of the vagina. The patient was very fat, and the vagina was narrow and rigid. Very little progress having been made, the forceps were applied late on the 12th, making it more than three days after the escape of the liquor amnii. The perinæum was ruptured, but the child was alive, and both it and the mother did well.

Perhaps on the whole labour is more tedious in old than in young primiparæ; the parts are much less elastic in the former, and hence lacerations are more to be feared if instruments are used.

Case 247.—Age not stated; sixth confinement. The labour was tedious, and the woman began to show signs of exhaustion. So many limbs could be felt through the abdominal wall that twins were suspected, but only one fœtal heart could be heard. The forceps were applied, and a living child was extracted. A second bag of membranes was felt; this was ruptured, and as no progress was made after waiting, the forceps were applied to the second child, which also presented by the vertex. Both children were alive and males. There were two separate placentæ. Ergotine was injected subcutaneously, but there was a little post-partum hæmorrhage.

Case 254.—Æt. 33; ninth confinement. Patient has always had bad times. Has three children living; the last four children have been stillborn; has had one bad miscarriage. On examination, membranes were felt close to vulva, very tense. They were ruptured; the head was above the pubes. No progress being made, and the pains having ceased, the senior assistant tried to put on the forceps without success. Dr. Horrocks also failed. Chloroform was given, and the head being pressed backwards through the abdominal wall, Dr. Horrocks was able to get just sufficient hold with the long forceps to enable him to pull the head into the pelvis. The forceps were now reapplied, and delivery effected. The patient was under chloroform for an hour and a half. The child was dead and macerated. The mother made a good recovery.

The above was a case in which special axis-traction forceps might have been an advantage (comp. Case 125). The difficulty, however, was to get the blades on at all, and it was not until the head was pushed backwards from the upper part of the symphysis pubes that this could be done. The child had been dead some days probably.

Case 261.—Age not stated; fifth confinement. The patient had severe cardiac disease, but it is not stated which valve was affected. She had had hæmoptysis in all her confinements. In the present one she brought up considerable quantities of blood, not less than three pints during the course of the labour. She became blanched and exhausted, so it was determined to expedite delivery. The long forceps were applied, but they kept slipping. Ultimately a firmer hold was obtained, and after some trouble, owing to the anterior segment of the cervix having to be pushed backwards over the occiput, a living female child was extracted. There was some post-partum hæmorrhage; the blood did not come in a gush, but went on oozing. As she had already lost a good deal by hæmoptysis, hot water was injected at once into the uterus but without effect. Perchloride of iron was now used with success. The patient rallied well, and got better so far as the puerperal condition went, but she died a few weeks later from dropsy and cardiac failure.

The forceps were used in the above case on account of the complications of heart disease and hæmoptysis. It is very interesting that the woman had had spitting of blood at each of her confinements. There is no doubt that delivery rescued her from the danger of death from continued hæmoptysis.

The two following cases are detailed, although they are not included in the Table; the forceps were used to the after coming head.

J. M., æt. 26; third confinement; pains few and not strong; pulse 100; os uteri small, and membranes ruptured. After waiting some hours, Barnes's bags were used to dilate the os. The breech was found presenting, traction was made, and a knee brought down; the occiput was posterior, and the head became hitched. The forceps were applied at once, and a living child delivered. Mother and child did well.

H. D., æt. 33; sixth confinement. There was very little

progress made owing apparently to a rigid os. After waiting a day or more, Barnes's bags were used, but without success. Chloroform was then given and the os dilated with the fingers; the membranes were ruptured, and a gush of liquor amnii carried a hand down by the side of the head. Version was at once performed, and delay occurring with the head, the child became blue, and the pulsations in the cord grew slow and feeble. The forceps were therefore at once applied to the after-coming head, and the child delivered alive. It died, however, in a few days. The mother did well.

Where there is plenty of room it is not very difficult to deliver the after-coming head by traction upon the body of the child, and manipulation of the head in various ways; but where there is any disproportion of parts, the head is often delayed for a time sufficient to kill the child, which speedily dies unless delivered. The forceps should be applied quickly in such cases when it is practicable.

Version.

This operation was performed in 90 out of the 25,636 viable cases, equal to ·35 per cent., or 1 in 285 (nearly). Podalic version was chosen in 80 instances, cephalic in 3, and in 7 cases the record is imperfect.

Malpresentation was the cause of interference in 49 cases; in most of these some part of the upper extremity presented; in others the cord was prolapsed, and in one the head was hitched above the pubes. Of these cases, 29 (20 males and 9 females) were stillborn, and 20 (9 males and 11 females) were born alive. Placenta prævia, with its accompanying hæmorrhage, was the cause of interference in 26 cases; of these 23 (14 males and 9 females) were stillborn, and 3 (2 males and 1 female) were born alive. Contracted pelvis was the cause of interference in 14 cases; in most of these, the conjugate diameter of the brim was chiefly if not entirely at fault; in several, the forceps were first tried in vain. Of these cases 11 (7 males and 4 females) were stillborn, and 3 (1 male and 2 females) were born alive. Accidental hæmorrhage necessitated quick delivery in one

case, and version was performed. The child was dead; the mother recovered. In 8 instances, version followed by traction failed to deliver, and craniotomy of the after-coming head was necessary.

Out of the 90 cases, 26 (12 males and 14 females) were born alive, and 64 (41 males and 23 females) were stillborn. Excluding the 8 cases where craniotomy was performed, there were 56 stillborn children after version in 82 cases; or 68·3 per cent. (nearly), or 1 in 1·46. It will be noticed that the number of deaths is much higher among the males than the females; the general explanation of this preponderance, namely, that the male head is larger than that of the female, is probably the correct one.

Of the mothers, 5 died, or 5·5 per cent., or 1 in 18; of these, 4 were placenta prævia cases, and 1 was a case of contracted pelvis. Of the 5 deaths, puerperal septicæmia with peritonitis was the cause in 2 cases; puerperal septicæmia and hæmorrhage in 1 case; hæmorrhage in 1 case, and internal hæmorrhage (?) in 1 case. In all the 5 cases where the mothers died, the children were stillborn.

Recently in placenta prævia cases, the forceps have been used instead of resorting to version, with greatly improved results to both mothers and children.

In most instances, the combined internal and external method, as described by Dr. Braxton Hicks, has been adopted. In 63 out of the 90 cases an anæsthetic, generally chloroform, was given.

Details of some of the more interesting cases are given below.

Case 1. *Placenta prævia; hæmorrhage; version; pyrexia; convalescence; secondary pleurisy and peritonitis; death.*—Æt. 18; second confinement; flooded for a fortnight. The day before delivery she did a hard day's work. When assistance was called she was not bleeding, but she was blanched, and her clothes and everything about her were saturated with blood. The os was dilated to the size of half-a-crown, and the placenta could be felt completely covering the aperture. It was detached from the lower zone of the uterus by sweeping the finger round, and Barnes's bags were introduced to further dilate the os.

Chloroform was given, and bipolar version performed. The left foot was brought down, and the patient allowed to recover from the anæsthetic. There being no uterine action, a full dose of ergot was given, and an hour later a dead female child was delivered. There was no post-partum hæmorrhage, and no trouble with the placenta. The next day there was a rise of temperature, and the discharges were rather offensive. The uterus was washed out with Condy's fluid, and quinine, in five-grain doses, was given. She was ill for about three weeks, after which she seemed all right, and was getting about. A week later she was taken ill with pleurisy, bronchitis, and peritonitis, and died in a fortnight, five weeks after parturition. No *post-mortem* examination was obtainable.

Case 2. *Contracted pelvis; failure of forceps; version; living child.*—Æt. 24; primipara. The pains were strong, and the os was fully dilated; vertex presented; membranes ruptured; but no advance was made in three hours. The long forceps were put on by the senior assistant, and later by Dr. Galabin, but they failed to deliver. The patient for a long time absolutely refused to take chloroform, and the question of perforation was seriously discussed. At length the mother consented to take the anæsthetic; so it was given, and podalic version was performed. First one and then the other foot was brought down; much traction was made, pressure being at the same time exerted upon the fundus uteri. A living female child was born, and both baby and mother did well.

In this case there was considerable difficulty in extracting the after-coming head, owing to the contraction of the conjugate diameter of the brim. The child was alive, and this was undoubtedly due largely to the fact that there was room between the head and the pelvis, on each side of the promontory of the sacrum, for the cord to pulsate.

Case 3. *Shoulder presentation with prolapse of the cord; cephalic version.*—Æt. 32; seventh confinement. It was found, on examination, that the hand was in the vagina, and the cord cold, flaccid, and pulseless, was prolapsed. The child was freely movable in the uterus, and the head was felt near the umbilicus. An attempt to replace the hand

into the uterus having failed, cephalic version was performed, converting it into a case of hand with head. The uterus now contracted well, and in a short time the child was expelled. It was a male, stillborn; cuticle peeling. The patient made an easy recovery.

In this case, knowing from the condition of the cord that the child was dead, podalic version might have been chosen, but the mobility of the fœtus was so good that it was decided to try cephalic version, and deliver with the forceps if the uterine contractions proved ineffectual.

Case 4. *Twins; spontaneous evolution of second child.*—Æt. 40; tenth confinement. A breech was found presenting, and a female child was soon born alive. Then a shoulder was felt, and this rapidly came through the os into the vagina, and under the pubic arch. The pains were very strong, and in less than an hour a male child was born dead, the buttock following the shoulder, and then the head. The woman and first child did well.

Case 5. *Twins; podalic version of second child.*—Æt. 21; second confinement. The first child was a vertex presentation, and was born naturally. The second bag of membranes was ruptured artificially, and then the right shoulder was felt presenting; the spine of the scapula and its vertebral border could be easily distinguished. Chloroform was given, the right leg brought down, and delivery easily effected by traction. The child appeared to be asphyxiated for a few minutes, but finally rallied, and both children and the mother did very well.

It is interesting to compare Cases 4 and 5. In Case 4, podalic version would, no doubt, have been performed, but whilst assistance was being called the shoulder had been driven too far under the pubes to permit turning; hence the child was stillborn.

Case 6. *Twins; podalic version of second child; both born alive.*—Æt. 21; primipara. First child, vertex presentation, born naturally; second child presenting by left elbow; no uterine pains. Chloroform was given, and podalic version performed, the right leg being seized and drawn through the os externum. Patient was now allowed to recover from the anæsthetic, and uterine action promoted by kneading

and rubbing the fundus. The child was soon born, and, although at first there was a little difficulty in inducing respiration, this was ultimately well established. Both the children were small but well developed, and they, with the mother, did well.

The interesting point about this case is the fact that no traction was made upon the leg after version, but that delivery was accomplished by kneading the uterus, promoting uterine contractions, and expelling the fœtus. When traction is made, the arms nearly always get above the head, and the head becomes extended; there is thus caused considerable delay at a very critical moment, resulting frequently in the death of the child.

Case 7. *Cross birth; tonic contraction of uterus; difficult version.*—Æt. 25; third confinement. The hand was found in the vagina, and the uterus firmly contracted on the child. Chloroform was given, but the tonic contraction of the uterine fibres was not diminished. The right hand was low down in the vagina; the left could be felt a little higher up; there was also a prolapse of the cord. The head was in the right iliac fossa, the abdomen of the child looking anteriorly. With great difficulty the right foot was grasped and brought down into the vagina, but the head did not ascend, and it was found impossible to complete the version. Dr. Galabin was sent for, and on arrival he tied a piece of string round the right leg and another piece round the right arm. After considerable traction, the right leg was born, and traction upon this was made until the whole child was born, the right hand being prevented from slipping over the head by traction on the string attached. The child was dead; the patient had a severe laceration of the vagina, and the confinement was followed by a severe attack of acute peritonitis. She ultimately recovered. Her first two confinements were natural. There was no pelvic deformity, and the difficulty attending delivery was owing to the unconquerable contraction of the muscular fibres of the uterus.

In another case similar to the foregoing chloroform was given; the uterus then relaxed, and turning was easily accomplished.

Case 8. *Deformed pelvis; podalic version; craniotomy.*

—Æt. 32; second pregnancy; the first ended in a miscarriage. Patient was subject to rickets; pelvis much deformed; promontory of sacrum projecting a great deal into the pelvis, and thus easily felt *per vaginam*. The membranes had been ruptured three hours; the os was fairly dilated, and a hand was presenting in front of the child's head; the uterus was tightly contracted round the child. Version was attempted in vain without an anæsthetic, but after chloroform had been given, a foot was got down with great difficulty. The body was born, but the head remained at the brim, and could not be extracted. It was perforated behind the ear, and afterwards through the hard palate, and was then born. There was slight post-partum hæmorrhage, which was controlled by kneading the uterus and injecting ergotine. The patient was under chloroform for more than two hours. She made a good recovery, except that her temperature rose on the eighth day to 104° F. without apparent cause. Five grains of quinine every four hours soon put her right.

Case 9. *Accidental hæmorrhage; version; recovery.*—Æt. 29; sixth confinement. Patient was only seven months pregnant, and whilst lifting some clothes (she had been washing) she became very faint, went home, retired to bed at the usual time, awoke about an hour afterwards, and found her clothes and the bed soaked with blood. She was seen at midnight, when she appeared cold; her pulse was 86; the head presenting, the os about the size of a shilling, and no blood escaping. Opium was given, but at 4 a.m. assistance was again sent for. She was found collapsed and pulseless, with cold extremities and sighing respiration. The os was about the same size, and she was not losing any blood. Barnes's bags were tried but failed to dilate the os; this was accomplished by means of the fingers. Version was performed, and a dead child extracted. The placenta was quite loose in the cavity of the uterus, which was filled with clots. The uterus was entirely emptied, and two thirds of a grain of ergotine were subcutaneously injected. After the operation she appeared to be dying; but there was no more hæmorrhage. Her legs and arms were firmly bandaged, milk, brandy, and eggs were freely given, and with the

exception that her temperature rose to 104° F. she made an uninterruptedly good recovery.

There can be no doubt that, in the above case, the placenta became partially if not completely detached when the woman was lifting the heavy clothes. She was so anæmic and pulseless after the operation that transfusion might very properly have been performed. This was not done, however, and the patient did well.

Case 10. *Pelvic contraction; failure of forceps and axis-traction forceps; version.*—Tenth confinement; had been delivered by instruments under chloroform six times previously. On examination, the pelvis was found to be contracted, especially the conjugate diameter of the inlet. The long forceps were applied, but it was impossible to extract. Axis-traction forceps (Dr. Galabin's) were then applied, and also failed. Bipolar version was then performed, and the child extracted as far as the head. There was considerable difficulty with this; but by traction on the malar bone and lower jaw delivery was ultimately accomplished. The child was apparently asphyxiated, and it was twenty minutes before respiration was induced. The mother made an easy recovery, but the child died on the second day.

On examining the records it was found that at the last labour of this woman craniotomy was performed after version, the head having become impacted in the pelvis. It will be noticed that pressure was made on the lower jaw. It was found impossible to apply the pressure in the ordinary way, and no bad results followed the method employed. The jaw was not injured. In other cases a little pressure on the lower jaw has been found very useful.

Case 11. *Left shoulder presentation; version; child died from convulsions.*—Æt. 27; fifth confinement. The left hand was outside the vulva, but version was performed without an anæsthetic. Much traction was required, and the leg was bruised. The child was living, and the œdema and discolouration disappeared in a week, but the child died shortly after from convulsions. The mother made a good recovery.

In several instances where a living child has been born after much traction on the after-coming head, death from

convulsions has resulted within a few days; probably from brain injury.

Case 12. *Transverse presentation; cephalic version; forceps; living child.*—Fifth confinement; previous confinements normal. Membranes unruptured; head on the left side, breech on the right; pains every few minutes. Between the pains, Dr. Horrocks performed cephalic version by external manipulation alone. The membranes were then ruptured at some distance from the os, and the head was made to engage the pelvic inlet. After further rupture of the membranes, the long forceps were applied, and a living child extracted. Mother and child did well.

Cephalic version undoubtedly gives the child a better chance of being born alive, but it is not always possible to perform it by the external method alone, as in the above case.

Craniotomy.

The number of cases in which the bulk of the fœtal skull was diminished by perforation or otherwise was 24, or 1 in 1074, or ·09 per cent. In the last report the proportion was 1 in 1310, or ·07 per cent. In 7 of the 24 cases the children were known to be quite dead before operation was resorted to; in 15 cases it was doubtful, or has not been recorded; so that in only two instances was the child known to be actually sacrificed. At the same time, it must be remembered that in some cases the child's life was placed in fatal jeopardy by attempts at delivery prior to the use of the perforator.

Four of the mothers died, one (two ?) from rupture of the uterus and two from suppurative peritonitis; particulars of these cases will be given. In the last report six of the mothers died. In one case the crotchet was used to extract after perforation. In one case the blunt hook was used to extract the head. In 5 cases the craniotomy forceps were used after perforation; in 3 of these the cephalotribe was afterwards employed to extract the head. In 8 cases the cephalotribe was used; in one of these the child was exen-

cephalous, and did not require preliminary perforation. Only one of the mothers died after cephalotripsy.

Of the 24 cases 13 were perforated through the base of the skull, the child having either presented by the breech, or version had been performed before craniotomy. In 11 cases the vertex was perforated.

The causes which led to the operation of craniotomy will be clearly seen from the following list:

Narrow pelvis	16 cases.
Hydrocephalus	2 „
Large child	1 „
Atresia vaginæ	1 „
Tedious labour	1 „
Not stated	3 „
	24 „

In 9 cases the forceps were tried in vain; in 6 cases the forceps and then version were tried in vain; in 2 cases version alone was tried without success. In one case the forceps were applied to the after-coming head. In one case the chest had to be perforated as well as the skull (Case 3).

Case 1. *Rupture of uterus; perforation of the after-coming head; death.*—Æt. 41; eleventh confinement. The uterine pains were severe for several hours. At first the os was scarcely at all dilated, but it gradually expanded, and the extern attendant stated that he had felt a vertex presenting. Suddenly the pains ceased, and the pulse rose rapidly to 120 per minute. Dr. Galabin was then summoned, and an anæsthetic administered. The lower part of the posterior uterine wall, or the upper part of the vagina, or both, were torn, and it was very difficult to recognise the different structures. No part of the fœtus could be felt for some time, but eventually a foot was found amongst the mother's intestines. It was brought down, and as there was great difficulty with the after-coming head this was perforated, and extraction was accomplished by means of a blunt hook. A great quantity of blood was lost, and gushed out after the head was born. The patient died in a few minutes after the birth of the child.

Case 2. *Traumatic atresia vaginæ; death.*—Æt. 26; second confinement. The pains were long and lingering.

The patient was the subject of vesico-vaginal fistula, and great atresia vaginæ caused by the first labour. An anæsthetic was given. Dr. Galabin made free incisions into the cicatricial tissue, and applied the long forceps. On making traction the rectum was torn; so craniotomy was performed and the child delivered. The mother died of suppurative peritonitis.

Case 3. *Contracted pelvis; craniotomy after forceps and version.*—Æt. 34; fourth confinement. Labour set in suddenly, and after twelve hours, although the os uteri was fully dilated, there was no advance of the head, which was felt above the brim. The long forceps were applied, and traction made for more than half an hour with no result; the pelvis was contracted in all its diameters. Version was then performed, but it was found impossible to get the arms down, or to deliver the shoulders. The chest was then perforated; the lungs were broken up, the arms brought down, and then the chest was delivered. The after-coming head was next perforated through the occipital bone, and, after a good deal of traction, was delivered. The mother made an easy recovery, although she refused to be syringed. Her first child was born alive, and is still living (16 years of age); the second and third were delivered with the forceps, and were still-born.

Case 4. *Forceps and version followed by craniotomy; rupture of uterus?; death.*—Æt. 25; fourth confinement. The pains having been strong and frequent for several hours, without any advance of the head, the forceps were applied, and good traction made without result. Version was then performed, but the head could not be extracted. The child was quite dead when the perforator was used on the occiput, and, as there was still great difficulty, a second perforation was made in the sagittal suture. The child was delivered and then the placenta; the uterus was washed out with a solution of Condy's fluid, and ergot was given. The woman was left pretty comfortable, but the next morning she was found in a dying state, and soon succumbed. No autopsy was allowed, but Dr. Galabin said, at the time of the operation, that there were symptoms of impending rupture of the uterus.

Case 5. *Forceps; axis-traction forceps; version; craniotomy; cephalotripsy.*—Æt. 24; third confinement. The patient having been in labour for 36 hours without any descent of the head, the long forceps were applied, and traction was made for half an hour. Tarnier's axis-traction forceps were then used without success. Chloroform was given, and version attempted; after much trouble, one foot was got down alongside the head, but the latter would not ascend. The foot was therefore pushed up again, and the vertex perforated; the cephalotribe was put on three times, and the head crushed; the head was finally delivered by means of the craniotomy forceps. The uterus and vagina were kept well syringed out with carbolic lotion, and the mother made an easy recovery. The difficulty in this case appeared to be due to the thickness and hardness of the bones of the skull, and the large size of the head. No mention is made of the result of her first two labours.

Case 6. *Breech presentation; hydrocephalus.*—Æt. 20; primipara. The child was born as far as the umbilicus when the extern first arrived. He made traction, and delivered up to the shoulders. No further progress was made, and the umbilical cord was quite pulseless; the uterine contents appeared to be much bulkier than would be accounted for by an ordinary fœtal skull. The child's head was perforated through the occipital bone, and a gush of cerebro-spinal fluid followed, but very little brain substance; the head was then easily delivered by a little traction on the trunk. The mother made an easy recovery. The circumference of the skull was nineteen and a half inches; mento-occipital diameter seven inches. The child also was the subject of harelip and double cleft palate.

Case 7. *Forceps; version; perforation; cephalotripsy.*—Æt. 31; fourth confinement. In the first confinement chloroform and instruments were used. In the second confinement the child was very small, and was born without help, after a tedious labour. In the third confinement she was removed to the London Hospital, where chloroform and instruments were used. She was found to be the subject of rickets. The tibiæ were much bent, and the pelvis was deformed, being especially flattened from before back-

wards; the conjugate diameter of the pelvic inlet was contracted most. The os being fully dilated, and no advance having been made for several hours, the long forceps were applied under chloroform, and proving unsuccessful, podalic version was performed; but it was found necessary to perforate the after-coming head, and finally to crush with the cephalotribe, before delivery could be accomplished. The mother made a good recovery.

Case 8. *Pelvic contraction; cephalotripsy; death.*—Æt. 26; primipara. The patient had a small pelvis, the conjugate diameter of the inlet being especially affected. The head was found to be tightly fixed, having partially entered the pelvic cavity. Under chloroform the resident obstetric assistant applied the long forceps, and made traction for an hour and a half. Dr. Horrocks was sent for; the vertex was then perforated, and the cephalotribe used to crush the head. Three separate crushings were necessary before delivery could be accomplished. The perinæum was lacerated, and five silkworm-gut sutures were used to sew it up. The patient subsequently died from suppurative peritonitis and pneumonia. This was the only case in which the mother died after cephalotripsy; the long attempt to extract by the forceps had evidently damaged the maternal tissues.

Case 9. *Tedious labour; forceps; perforation; craniotomy forceps.*—Æt. 42; thirteenth confinement. The patient had been in labour a considerable time; the os was fully dilated and the head well engaged in the brim, but no advance was being made. The long forceps were applied by both the senior assistant and Dr. Galabin without success; finally, Dr. Galabin perforated, and the head was extracted by the craniotomy forceps. The patient made an easy recovery. Of her twelve previous confinements eleven children were born alive, one of them was a breech presentation; her ninth child was stillborn.

Case 10. *Large child; breech presentation; perforation of after-coming head.*—Æt. 35; ninth confinement; the breech presented. The patient had been in labour several hours; the os was fully dilated, and no advance was being made. With considerable difficulty Dr. Horrocks got one foot

down; chloroform was then given, and the other foot extracted. It was found that the child was a very large one; as it was dead, and traction caused no progress, the head was perforated and the child delivered. It was a female, and weighed eleven pounds.

Case 11. *Hydrocephalus; perforation.*—Æt. 22 (?); sixth confinement. Patient had not felt the child move for three weeks before her confinement; both feet presented. The pains being feeble, traction was made; the arms got above the head, and were brought down in the usual way; the head stuck at the brim, and so was perforated, a lot of thin fluid escaping. On delivery, it was found to be hydrocephalic; the mother easily recovered. The child's abdomen was much distended, and the skin purple in colour, with a fetid odour.

Case 12. *Face presentation; forceps; cephalotripsy.*—Æt. 23; second confinement; the previous child was born seven years before, and the labour was lingering. The patient had been in labour all day. After rupture of the membranes it was found that the face presented. The long forceps were applied, but no advance could be made. Perforation was resorted to, and the cephalotribe used in two diameters; the child was then extracted. The conjugate diameter of the inlet was diminished. The uterus was washed out with Condy's fluid, and the mother made a good recovery.

Case 13. *Narrow pelvis; forceps; perforation; cephalotripsy.*—Æt. 28; primipara. The membranes having been ruptured for more than twenty-four hours, and the patient becoming exhausted, the forceps were applied without success. Craniotomy was then performed, the head crushed with the cephalotribe, and easy extraction made. Condy's fluid was used to wash out the uterine cavity, and the mother easily recovered.

Case 14. *Narrow pelvis; version; forceps; cephalotripsy.*—Æt. 30; ninth confinement. The membranes having been ruptured upwards of twelve hours, and no progress being made, version was performed under an anæsthetic. The head could not be extracted, and so it was perforated; it had to be crushed finally before delivery could be effected. Before perforating, the forceps were tried in vain to the

after-coming head. Of her eight other confinements, two ended in the birth of living children, and they are both still alive. One of these (second confinement) was born without assistance, the other (fifth confinement) was delivered by the forceps. All the other children were stillborn, and most of them were only delivered by instrumental aid. She was a German. The pelvis was contracted, especially in the conjugate diameter of the brim. The uterus was syringed out with Condy's fluid, and the patient did well.

Case 15. *Narrow pelvis.*—Æt. 34; sixth confinement. The membranes protruded nearly to the vulva; they were ruptured, and, with the gush of liquor amnii, fourteen to sixteen inches of cord came down; it was pulsating; the head was jammed at the brim. Dr. Horrocks was sent for, and at once perforated. Having tried the long forceps and the craniotomy forceps in vain, the cephalotribe was used in two diameters, and extraction affected. On careful examination afterwards it was found that the conjugate diameter of the brim was only two and three quarter inches. The patient was a very rickety subject; all her previous children had been stillborn, and delivered with instruments.

Case 16. *Exencephalous fœtus; face presentation; forceps; cephalotripsy.*—Æt. 24; fourth confinement; the face presented. The long forceps were tried, but slipped off. It was then found to be an exencephalous fœtus. The craniotomy forceps were applied, but traction failed to deliver; the cephalotribe was then used, and the head crushed. Much difficulty was experienced in delivering the shoulders. The patient recovered well.

Rupture of Uterus or Vagina.

Five cases occurred, or 1 in 5098. In the last report 7 cases occurred, or 1 in 3371.

All the patients died, 3 of them in a few minutes to a few hours, and 2, where abdominal section was performed, lived one and two days respectively. Two of the cases have been already described under Craniotomy (*vide* Cases 1 and 4). Details of the remaining 3 cases are here given.

Case 1. *Uterine inertia; ergot given; rupture of uterus; abdominal section; death.*—Æt. 32; sixth confinement. Patient was walking about the room, the membranes had been ruptured six hours, the os was fully dilated, and the vertex presented; uterine pains occurred about every twenty minutes, but were not strong. The extern, having waited some time, gave a drachm of the liquid extract of ergot, and in about an hour she had two severe pains and then no more. It was then found that the head had disappeared. Dr. Galabin was summoned, and discovered a rupture in the uterus. Ether was administered and abdominal section performed; an incision was made from the umbilicus down to within a short distance of the pubes; a large amount of blood escaped from the peritoneal cavity. The leg of the child was seized, and delivery accomplished through the abdominal wound; the placenta was then detached and removed. The peritoneal cavity was cleaned out by sponges soaked in carbolic lotion. A large drainage-tube was passed along the vagina through the rupture and through the abdominal wall. The incision in the latter was sutured with silk ligatures, and the wound dressed with carbolised dressings; strapping was applied to support the abdominal walls, and the whole surrounded by an abdominal binder of stout linen. A hypodermic injection of a quarter grain of morphia was administered, and half a grain of Morph. Suppos. ordered every four hours. Radial pulse was imperceptible at the wrist; the carotid pulse was 140. She passed a good night. The wound was dressed the next day, and the vagina syringed out with carbolic lotion; the drainage-tube was blocked. On the second day the wound swelled badly; the temperature was 103° F., there was collapse, cold extremities, and pain. She died at 8 p.m., about forty-eight hours after the operation.

It is a rule in the Guy's Charity not to give ergot until after the placenta is born, and the records do not state why this rule was broken in the present case. Scientifically, however, it is of considerable interest to note that the contraction which ruptured the uterus, took place in about an hour after the drug had been taken.

Case 2. *Rupture of the uterus; abdominal section; death.*

—Æt. 42; thirteenth confinement. Three months before, the patient had a blow on the abdomen, and was stunned; some blood was lost *per vaginam*. She was a stout, flabby, dark-complexioned woman. The labour pains were frequent and strong, the head presenting in the first position, and the os fully dilated when the patient was seen; she was in considerable pain, however, and vomited more than once. A few hours later she suddenly complained of great pain, and shouted "Oh, my stomach," turned very pale, and became collapsed. The head was felt, but it had evidently receded, and there was pure blood on the examining finger. Dr. Galabin was sent for, and the long forceps were used under his direction; it was found impossible to get them on to the head properly, owing to its recession. Ether was administered, and abdominal section performed; the legs and greater part of the body of the child were found in the abdominal cavity. The child was extracted, a little difficulty being met with in drawing the head through the rent in the uterus; the placenta was extracted also. The rent was a transverse one across the anterior wall, about two to three inches above the os internum. A good deal of blood was sponged out of the abdominal cavity, and the rupture sewn up carefully with silk. The abdominal wound was then sewn together, and dressed with gauze. Morphia was administered, and the vagina syringed out, but the patient died in twenty-four hours. The temperature rose to 101° F., and the limbs became cold. The child was dead; it was a male, and large.

Case 3. *Placenta prævia; rupture of uterus; death.*—Æt. 31; fourth confinement. During labour, the woman was stooping over a chair, when she experienced a severe pain in the abdomen, and then felt some blood coming away from her. She sent to the hospital for help, and it was found that the funis and placenta were presenting. Dr. Galabin came with the assistants, and he diagnosed rupture of the uterus, but in a few minutes the woman was dead. She was undelivered, and no autopsy was allowed.

Post-partum Hæmorrhage.

The amount of hæmorrhage which constitutes so-called "post-partum" has not been defined, and it is difficult to know whether some of the cases recorded by students were anything more than what would be considered a normal loss. At all events, the total number of cases recorded is 342, or 1 in 74, or 1·3 per cent. Special reports have been made in 96 instances, whilst in the remaining 246 cases it is simply stated that there was post-partum hæmorrhage, without any further particulars being given. Out of the 342 cases, 14 of the mothers died, and 38 of the children were stillborn. Of the 14 maternal deaths, 7 were from hæmorrhage alone, 4 from subsequent septicæmia, 1 from scarlet fever, 1 from erysipelas, and 1 from heart disease. Details of 12 cases will be given; the thirteenth has been already given as Case 261 under the heading of Forceps, whilst there is no report of the fourteenth.

In 14 cases a solution of perchloride of iron (1 part of the strong solution to 3 to 8 of water) was injected into the uterus, after the failure of the ordinary methods, and the bleeding was arrested, with the result that thirteen of the mothers recovered, and only one died; details given below. In the majority of the cases ergot was given, a teaspoonful of the powder, or of the liquid extract; the hæmorrhage ceasing very soon, except in comparatively few instances. Ice was used in the vagina twelve times, but the result was not satisfactory, and other measures were employed. In no case was transfusion performed; in one instance, however, the operation was commenced, but the patient died before it could be completed.

In 35 cases the placenta was retained, and had to be removed by introducing the hand into the uterus; in 30 of these, the placenta was adherent, and in 5, detached. In 6 cases the mothers died (*vide* Nos. 8, 10, 14, 15, 17, 20), showing that hæmorrhage from adherent and retained placenta is very fatal. Experience shows that when hæmorrhage takes place before the delivery of the placenta, it is advisable to extract it at once, either by expression, or, failing that, by the introduction of the hand into the uterus

as far as may be required, and peeling off any adherent portion; proper pressure, squeezing, and manipulation of the uterus will then stop all further bleeding in the majority of cases.

In 31 of the 96 reported cases, more or less pyrexia, with accompanying febrile symptoms, followed; in 10 cases there had been ante-partum hæmorrhage; in 10 cases version had been performed; in 33 cases forceps had been used.

Case 1. *Adherent placenta.*—Æt. 23; third confinement. All went well until the child was born, when post-partum hæmorrhage set in; it was found that the placenta was partially detached, and in part adherent. Manipulation of the abdomen failed to stop the bleeding; ergot was given, and help sent for; the patient became blanched from loss of blood. It was found necessary to pass the hand into the vagina and the fingers into the uterus before the placenta could be detached; the part adherent was on the anterior wall, and was about the size of the palm of the hand. The bleeding lessened, but did not stop entirely, and so more ergot was given. Finally, cold water was injected into the uterus; good contraction was obtained, and the bleeding stopped completely. The patient made a good recovery. The child was a female, and was alive.

Case 2. *Forceps; injection of iron solution.*—Æt. 23; primipara. Forceps used and perinæum ruptured. Sharp hæmorrhage came on half an hour after the child was born; the uterus filled with blood. Manipulation and injection of cold water having failed to stop the bleeding, a solution of Liquor Ferri Perchlor. (1 part of the strong solution to 7 parts of water) was injected into the uterus, and the hæmorrhage was immediately arrested. A sloughy condition of the ruptured perinæum, with septicæmic symptoms, supervened, but the patient ultimately recovered.

Case 3. *Ante-partum hæmorrhage; breech presentation; death.*—Æt. 30; sixth confinement. Severe ante-partum hæmorrhage came on, and it was found that the cervix uteri was indurated and thickened about the os externum, suggesting malignant disease. Diluted Liq. Ferri Perchlor. was applied to this hard part, and the bleeding stopped. After some hours, little advance being made, chloroform

was given, and the child extracted; it presented breech first, but was born alive, and the placenta soon followed. She was in good condition when left, but in an hour or more a sudden flooding set in, which ended fatally in a few minutes. The uterus was strongly contracted after death; no autopsy was made.

Case 4. *Secondary hæmorrhage; peritonitis; death.*—Æt. 19; primipara. The child was born before the arrival of assistance, and the placenta was expressed with difficulty. When it came away many clots of blood accompanied it, and more kept forming; so the uterus was cleared out. She went on losing blood for some time, but ultimately it stopped. Three days later the temperature was 103° F., and on the fourth day hæmorrhage set in, filling the uterus, which felt flabby; its cavity was cleared out, and washed with cold water. Ergot was given, and, subsequently, quinine and opium. Peritonitis came on, and she died on the tenth day.

Case 5. *Twins; injection of iron solution.*—Æt. 27; third confinement. When the extern arrived one child was born, and he tried to remove the placenta; he was unable to do so, and considerable hæmorrhage took place. The second child was soon born, and after detachment both placentæ. Bleeding, however, continued, and manipulation, ergot, and cold water injections having failed, Liq. Ferri Perchlor. (1 in 10) was injected into the uterus, causing immediate cessation of the bleeding. The mother and children did well; the latter were both males.

Case 6. *Placenta prævia; ante-partum hæmorrhage; death.*—Age not stated. Five weeks before labour had a slight hæmorrhage; six days before had a sharp attack, and sent for assistance. Rest and opiates stopped the bleeding, but it recurred in a few days, and it was then discovered that there was a placenta prævia; the membranes were at once ruptured; the os was only slightly dilated. Bleeding stopped for a time, but recurred; the placenta was therefore separated from the lower zone of the uterus, and no further bleeding occurred until after the birth of the child. Barnes's bags had to be used subsequently to obtain full dilatation of the os. Labour was

completed naturally about half an hour afterwards. One edge of the placenta was found covered with clots and bruised. The patient was very weak, with a pulse of 140; during the next six hours she had some more bleeding, and died in about twelve hours.

Case 7. *Forceps; injection of iron solution.*—Æt. 22; primipara. Forceps were applied, owing to a tedious second stage; the child was born alive, but the perinæum was ruptured. A weak solution of Liq. Ferri Perchlor. was injected into the uterus, stopping the hæmorrhage at once after manipulation, ergot, and cold-water injections had failed. The mother had a temperature of 102° F. for a few days, but did well.

Case 8. *Retained placenta; puerperal fever; death.*—Æt. 35; fifth confinement. The child was born before the extern arrived, and the nurse had tried to deliver the placenta by pulling upon the cord; she broke the cord and set up bleeding. The extern was unable to deliver the placenta, and help was sent for. The hand was passed into the vagina, and the fingers into the uterus; in this way the placenta was removed, along with many clots. It was found that the cord had been broken off close to its attachment to the after-birth. External manipulation was made, whilst one hand was kept *in utero*, until expelled by the uterus itself contracting; in this way further bleeding was prevented. She was syringed out with Condy's fluid, but symptoms of puerperal fever showed themselves on the third day. There was no offensive discharge. Syringing, however, was kept up, but she died exhausted on the tenth day.

Case 9. *Forceps; injection of iron solution.*—Æt. 22; primipara. The forceps were used owing to protracted labour. The perinæum was ruptured, and sharp post-partum hæmorrhage followed immediately after the child was born. It was thought afterwards that it came from a lacerated cervix. Liq. Ferri Perchlor. was injected, and the bleeding stopped. Mother and child did well.

Case 10. *Adherent placenta; pleurisy; pyæmia; death.*—Æt. 37; twelfth confinement. Patient had had pleurisy recently, and was in an exhausted condition. The os was

dilated with Barnes's bags, and uterine pains soon expelled a living male child. Bleeding followed, and it was found necessary to peel off an adherent placenta before it could be stopped. On the third day there was general pyæmia, but no obvious peritonitis. The wrists and ankles were swollen, and apparently contained pus. The uterus was syringed out with iodine water. The patient died on the fourth day.

Case 11. *Injection of hot water.*—Æt. 24; primipara. Low forceps operation for tedious labour. Sharp hæmorrhage followed, and it was stopped by water, at a temperature of 110° F., injected into the uterus. Mother and child did well.

Case 12. *Forceps; retained placenta; injection of a solution of iron.*—Æt. 30; ninth confinement. Low forceps having been used successfully owing to a tedious labour, it was found impossible to express the placenta. The hand was introduced, and the placenta peeled off. Hæmorrhage set in at once, and went on to an alarming extent. A solution of Liq. Ferri Perchlor. (1 in 8) was injected into the uterus, but the bleeding continued. A stronger solution (1 in 4) was employed; this stopped the hæmorrhage, but the patient was so blanched, and the pulse so feeble and rapid, that Dr. Galabin was summoned. He did not think it advisable to perform transfusion; brandy and opium were given. The senior assistant remained with the patient all night. She ultimately recovered, but had considerable pyrexia. It transpired that she had flooded at all her confinements.

Case 13. *Forceps; injection of hot water and a solution of iron; death.*—Æt. 26; third confinement. There was some ante-partum hæmorrhage; opium was given, and rest enjoined. The hæmorrhage continued, and so the membranes were ruptured; the bleeding ceased. Later the forceps were applied, and a stillborn male child was extracted. After the delivery of the child ergotine was injected subcutaneously; the placenta was then born, and hæmorrhage set in. More ergotine was injected; the woman became collapsed, and the pulse was difficult to feel. Hot water was injected into the uterus; the bleeding went on, and five ounces of Liq. Ferri Perchlor., diluted with water, were then

injected. The bleeding ceased at once, but the woman was very low; brandy and ether were injected subcutaneously every half hour, but she died in three hours.

Case 14. *Portion of placenta adherent; secondary hæmorrhage; suppurative peritonitis; death.*—Æt. 19; primipara. The child was born alive naturally, and a few minutes afterwards hæmorrhage took place. The extern passed his hand into the uterus, and removed the placenta; the bleeding then ceased. The patient went on well for twelve days, when hæmorrhage recurred; ergot and opium were administered, and the bleeding stopped. Two days later it recurred very profusely, and the patient became blanched and weak; her temperature was normal. The vagina was plugged, and next day the patient was taken into the hospital. Dr. Galabin found a small piece of adherent placenta in the uterus, and removed it. The patient developed symptoms of peritonitis, and died in six days, *i. e.* twenty-one days after the confinement. At the autopsy, intense suppurative peritonitis was found.

Case 15. *Secondary hæmorrhage; adherent pieces of placenta; death.*—Æt. 28; second confinement. The patient had two attacks of hæmorrhage during the first week after her confinement; she had no treatment, and the bleeding ceased. A third flooding came on, and she sent for help. She was found to be blanched, and in a very dangerous state; ergot and brandy were given, and the vagina plugged. The next day Dr. Galabin saw her, and removed some small pieces of adherent placenta. The following day fresh bleeding took place, and the patient died.

Case 16. *Adherent placenta; injection of a solution of iron.*—Æt. 23; fourth confinement. The labour was rather tedious, and the child was born dead. Hæmorrhage took place immediately, and the patient became blanched, nearly pulseless, sighing, and restless. Help was summoned, and the placenta removed, after peeling it from the walls of the uterus; ergotine and brandy were injected, and the walls of the uterus well kneaded. The bleeding stopped, but the condition of the patient became most alarming; the breathing was very shallow, and the pulse scarcely perceptible. The uterus relaxed every time the hand was removed. A

solution of perchloride of iron was therefore injected, and brandy was repeatedly injected subcutaneously. Dr. Galabin came, and got the transfusion apparatus ready, but as the patient had rallied a little, determined to wait. The lower extremities were bandaged and raised. The senior and junior assistants watched alternately by her bedside all night, with the transfusion apparatus in readiness. Brandy was administered subcutaneously every ten minutes, and by enemata every four hours; also beef-tea was injected. For some days the temperature was 102° F., but ultimately the patient recovered.

Case 17. *Adherent placenta; scarlet fever; death.*—Æt. 37; sixth confinement. A living child had been born on the arrival of the extern, and the patient was blanched from loss of blood. The pulse was quick and small. Pressure was made on the uterus until further assistance arrived, when the placenta, which was adherent, was peeled off and removed. Hot and cold injections were given, ergotine administered subcutaneously, and the child applied to the breast. The bleeding stopped, and the patient was watched for three hours. The next day the temperature was 104° F., and she vomited and complained of sore throat. On the third day the pulse could not be counted; temperature 104° F., urine and fæces passed under her; was covered with scarlet-fever rash, and died during the night.

Case 18. *Erysipelas; death.*—Æt. 35; fifteenth confinement. The patient was enormously stout. She had a normal labour up to the birth of the placenta, when severe post-partum hæmorrhage occurred. This was stopped by manipulation of the uterus, injection of ergotine subcutaneously, and administration of the liquid extract of ergot by the mouth. Next day the temperature was 101° F., and she had considerable abdominal pain. On the third day vomiting set in, and she passed several large clots. She became worse; a few erythematous patches developed on her body; the lochia became rather offensive, but nothing could be found in the uterus; the vomiting was distressing, the vomited matter being dark brownish in colour. She died on the fourth day. It was discovered afterwards that, at the time of the confinement, a child

three years old was lying in the same bed suffering from erysipelas following a burn on the leg.

Case 19. *Death from hæmorrhage.*—Æt. 34; tenth confinement. The patient was in a weak condition from starvation, her husband having been out of work for six months. She had a protracted labour, and the child was stillborn. Some hæmorrhage followed, but it stopped after the administration of a drachm and a half of the liquid extract of ergot, and cold applications to the vulva. Although the amount of blood lost was not very excessive, she got into a very alarming condition, face blanched, pulse almost imperceptible. Brandy was given, the legs were bandaged and raised, &c., but she ceased breathing in a short time. Artificial respiration was carried on for some time without effect.

Case 20. *Adherent placenta; death from hæmorrhage.*—Æt. 33; ninth confinement. There was no history of hæmorrhage at any of her previous confinements. The labour was natural up to the birth of the child. Whilst waiting a few minutes for the expulsion of the placenta the extern noticed that the patient became pale, and her pulse rose to 120. On vaginal examination, he found the uterus full of clots and the placenta still in its cavity. He sent for help, and did all he could in the meantime. The junior assistant arrived first, and tried to remove the placenta; much blood was lost, so he sent for some solution of iron. Dr. Horrocks then came and removed the placenta, which was very firmly adherent in the greater part of its area. Afterwards the uterus was swabbed out with a diluted solution of Liq. Ferri Perchlor. The amount of blood lost by the woman was very great. Her pulse was imperceptible at the wrist, and Dr. Horrocks immediately proceeded to transfuse. Bandaging of the lower extremities, raising the lower part of the body, injections of brandy and ether under the skin, were all done, but by the time the median basilic vein was exposed the woman was dead. No autopsy was made.

Case 21. *Ante-partum hæmorrhage; injection of a solution of iron.*—Æt. 27; fifth confinement. When the extern arrived, the os was the size of half a crown; some bleeding

was going on, and altogether she lost about a pint; he plugged the vagina, and sent for help. When this came the plug was removed, and it was found that bleeding took place only during the pains, which were infrequent and irregular. A binder was put on with the object of preventing intra-uterine accumulation of blood; the membranes were ruptured, and further assistance sent for. Dilatation of the os was accelerated by digital pressure, until it was large enough to admit the forceps; these were used, and a living child extracted without difficulty; about a pint of blood followed the child. The placenta was easily expressed, but the bleeding continued to an alarming extent. Several subcutaneous injections of ergotine were given, hot water was injected into the uterus, and one hand was passed into the uterus while the other made pressure outside. Hæmorrhage still continuing, a solution of Liq. Ferri Perchlor. (1 in 6) was injected into the uterus, which stopped all further bleeding, and caused good contraction of the womb. The mother did well. Examination of the placenta showed signs of a localised separation of its margin about the size of a crown piece. There was no history of a blow or a fall.

Case 22. *Adherent placenta; severe hæmorrhage; recovery.*—Age not stated; fifth confinement. After the birth of the child severe hæmorrhage took place, and the placenta could not be expressed. Help was sent for, and the placenta, which was adherent, was peeled off and removed. The patient was in a state of syncope, blanched and pulseless. Two thirds of a grain of ergotine and twenty drops of brandy were injected subcutaneously. After a time the pulse became perceptible at the wrist. No further hæmorrhage took place, and ultimately she made a good recovery.

Case 23. *Hour-glass contraction of the uterus.*—Æt. 24; fifth confinement. The child was born without difficulty. After its birth the extern gave some ergot; he then found he could not remove the placenta. Hæmorrhage took place. Help was summoned, and it was found that whilst the os and cervical canal were widely patent, there was a narrow constriction above. This would not yield to the pressure of the fingers formed into a cone. Chloroform was then given, but the placenta had to be removed piecemeal, owing to the

difficulty experienced in reaching into the cavity of the uterus through the constricted part. The mother did well.

Placenta Prævia.

Fifty-one cases occurred, or 0·2 per cent. In the last report there were forty-one cases, or 0·17 per cent.

Of the present series fourteen were complete, twenty-two partial, and fifteen doubtful or not stated. There was hæmorrhage to a greater or less extent in every case except one. Nine of the mothers died, or one in six (nearly), or 17·6 per cent, four from hæmorrhage, four from septicæmia, and one from rupture of the uterus. Details of five cases (Nos. 1, 6, 17, 18, and 20) are given below. In one case no details are given, and the three remaining cases have been already described (*vide* Case 3, Rupture of Uterus, Case 1, Version, and Case 6, Post-partum Hæmorrhage.) From a study of the details of the cases it will be found that in many instances the fatal result was due in some measure to delay in obtaining medical assistance.

Thirty-four of the children were stillborn, or 66 per cent. In two cases the patients died undelivered. Version was performed in twenty-six out of the fifty-one cases. The mortality amongst the children is very great, but it is not so great as in the preceding report (thirty-one out of forty-one), and in both it must be remembered that very frequently the labour was premature (sixth to ninth month). No doubt the hæmorrhage tends to weaken the child, and, in addition, the labour is often accelerated and version performed quickly before full dilatation of the os, in order to prevent hæmorrhage; hence the head is caught by the os, and the child dies before it can be extracted.

There can be no doubt that when a placenta prævia has been found, it is best to plug the cervix in order to stop further hæmorrhage. Barnes's bags answer well because they dilate the os at the same time. The case should be carefully watched, and a larger bag put in as soon as may be required. Then by rupturing the membranes, and if necessary, separating the placenta from the lower

zone, and delivering the child by forceps or version, the risk of further loss of blood is diminished. If the vertex is presenting, the use of the forceps gives the child a better chance than version, but inasmuch as the labour is often premature, the ordinary forceps are apt to slip off.

There were two cases of transfusion (*vide* 20 and 21), but in neither instance was much, if any, good done. One patient died and the other recovered.

Case 1.—Æt. 37; eleventh confinement. Lost a large quantity of blood before assistance arrived. The edge of the placenta could be felt through the os uteri. The vagina was plugged, the bleeding and the pains then ceased. The breech presented; after removing the plug a leg was brought down and a living child born. There was no post-partum hæmorrhage, but the woman was weak and had a pulse of 120 per minute. She had a temperature of 102° to 104° F. the next few days, and some varicose veins on the right thigh became inflamed. She died on the eighth day.

Case 2.—Æt. 31; eighth confinement. In this case there was slight hæmorrhage for over twelve hours; it was then found to be placenta prævia partial. It was peeled off from the cervical zone, and the membranes ruptured; there was no further hæmorrhage. The child was born alive, and there was no post-partum hæmorrhage. Mother did well.

Case 3.—Æt. 44; tenth confinement. Pregnant seven and a half months, when bleeding began and labour set in. It was found to be placenta prævia; the edge could be felt through the os. It was peeled off from the cervical zone, the membranes were ruptured, and podalic version was performed. Ergot was given after the leg had been drawn down; the child was stillborn. There was no post-partum hæmorrhage, and the mother did well.

Case 4.—Æt. 27; third confinement. Pregnant eight months. Bleeding went on some days before help was summoned. The os was fairly dilated, and the edge of the placenta could be felt. It was peeled off from the cervical zone, the membranes were ruptured, and bipolar version was performed. When the foot was drawn down, ergot was

given; the child was stillborn. There was no post-partum hæmorrhage, and the mother recovered well. Her pulse was quick for some days.

Case 5.—Æt. 25; fourth confinement. Pregnant seven and a half months. After lifting a heavy weight, flooding set in, and she lost two pints, according to her own statement. She was found weak and anæmic, the os barely admitting the forefinger; the placenta could be felt. High up anteriorly, the vertex was presenting. No further loss took place to any extent, and after a few hours, it was found possible to reach the cervical zone, from which the placenta was peeled. Chloroform was given, and Dr. Galabin turned by the bipolar method. Ergot was now given, but it was more than two hours before the child was extracted; it was quite dead. During the traction, the child made many convulsive efforts in the early part, and also cried *in utero* several times, so as to be distinctly heard by all in the room. There was no post-partum hæmorrhage, and although the patient was very weak, and passed through several days with pyrexia, she ultimately did well.

Case 6.—Æt. 26; fifth confinement. This patient died from hæmorrhage which lasted several hours. The extern tried to stop the bleeding by means of cold cloths and the administration of ergot. Much delay was caused by the fact that no messenger could be obtained for a long time. When the junior assistant arrived the woman was dead. A post-mortem examination on the following day revealed a placenta prævia.

Case 7.—Æt. 24; fifth confinement. This patient was pregnant seven and a half months, and bleeding came on when she was quietly walking downstairs. She lost considerably but was not exhausted; the edge of the placenta could be felt. Chloroform was given, and Barnes's bags inserted from the smallest to the largest. Then the membranes were ruptured, upon which a large portion of the umbilical cord came down through the os uteri, and could not be replaced. Chloroform was again administered, but the cord could not even then be put back, nor could the forceps be applied by the senior assistant, so he performed podalic version. The child was stillborn; the mother did well.

Case 8.—Æt. 36 ; eighth confinement. This patient had had hæmorrhage on two previous occasions. This time she lost a great deal more, and her clothes seemed to be saturated. The membranes were intact, and the os was fully dilated ; an inch from its margin the edge of the placenta could be felt. Bipolar version was attempted, but when the child was in the transverse position, head to left, the membranes were ruptured artificially, and a leg seized and brought down. The child was soon born, but was quite dead. The mother did well.

Case 9.—Æt. 21 ; third confinement. Similar case to the last, the patient losing a good deal of blood. Dr. Galabin performed version, but the child was dead. The mother did well.

Case 10.—Æt. 33 ; fifth confinement. In this case the patient went to her full time, and bleeding took place suddenly without apparent cause, and before she knew she was in labour. On examination, the os just admitted the finger, and a soft friable mass could be felt. Later, when the os was larger, the mass could be felt, but no membranes and no presenting part. The whole hand was passed into the vagina, and a central placenta prævia could be made out. Chloroform was given, and under Dr. Galabin's directions, the placenta was perforated by the fingers until the membranes were reached, and rupture effected. The vertex could then be felt. Podalic version was performed, and a stillborn child delivered. All this time not much bleeding took place. The patient did well. Ergotine was administered.

Case 11.—Æt. 32 ; tenth confinement. Pregnant eight months. Hæmorrhage took place suddenly, for which she came to the hospital. She was sent home, kept in bed, and opium was given. She went on well for a fortnight, when bleeding began again. The os now dilated a little, and a placenta prævia could be felt ; the whole of the os was covered by it. Barnes's bags were introduced, and after further dilatation, the edge of the placenta was separated posteriorly, and, the membranes being felt, were ruptured. A foot was presenting ; this was brought down, and a stillborn child delivered. The mother did well.

Case 12.—Æt. 28; third confinement. Patient was pregnant seven months when bleeding came on. The os was found to be the size of half a crown. Chloroform was given and the os further dilated with the fingers; the edge of the placenta could just be felt. The membranes were ruptured, and there was sharp hæmorrhage for a short time. The long forceps were applied, but they slipped off when traction was made. Version was performed; the upper extremities became extended; they were brought down. As the head did not come down the forceps were applied, and a living child was born; it died, however, the same day. The mother did well.

Case 13.—Æt. 29; sixth confinement. Bleeding began when she was seven months pregnant, and lasted two days before she sent for help. The os was dilated to some extent and the placental edge could be felt. Dr. Galabin was sent for and injected ergotine subcutaneously. Sharp pains came on and a dead child was expelled. The mother did well.

Case 14.—Æt. 44; fourteenth confinement. Patient was seven months pregnant, and was under Dr. Moxon on account of bronchitis. Bleeding commenced, and placenta was felt presenting. Barnes's bags were inserted, and after dilatation, membranes as well as placenta could be felt; breech presenting. The membranes were ruptured, and a foot brought down. Ergot was now given and a living child born, but it died in half an hour. The mother did well.

Case 15.—Æt. 26; fourth confinement. Patient had a slight attack of hæmorrhage on July 31st, and a second and third attack, with about a fortnight's interval, losing about a cupful with the second, and a pint with the third attack. On October 15th, she had a sudden and severe loss, and labour set in. The os was dilated to some degree, but was rigid; the placenta could be felt. Barnes's bags were employed, and afterwards the hand. Ultimately a foot was got down, and when the breech was engaged ergot was given. Pains soon came on and a stillborn child was delivered. There was a little hæmorrhage after the birth of the placenta. The mother did well.

Case 16.—Æt. 30; sixth confinement. Pregnant eight

months; had had two stillborn children and one cross birth. Bleeding set in sharply, and she was in a blanched and fainting condition when help arrived. The vagina was full of clots, and the os slightly dilated with the soft placenta presenting. The vagina was plugged whilst further assistance was being sent for. Then chloroform was given and the plug removed. The os was dilated with the fingers, the placenta separated from the cervical zone, the membranes ruptured, and a foot brought down; the child was stillborn. Ergotine was injected subcutaneously. The mother did well.

Case 17.—Æt. 27; third confinement. Patient bled for ten hours before sending for help. She was blanched, and her clothes saturated with blood. The os was the size of a shilling, the vertex presenting. Barnes's bags were used and afterwards chloroform was given, and further dilatation made with the fingers. The edge of the placenta could be felt. As the bleeding continued version was performed, a foot brought down, and a dead child delivered. Ergotine was given. The mother complained of much pain, and her temperature rose to 102° F., and pulse to 116 during the next day or two. On the fourth day secondary hæmorrhage came on during the night. She lost about half a pint of blood for which no cause could be discovered. She died on the sixth day, apparently from anæmia and exhaustion.

Case 18.—Æt. 36; tenth confinement. Extern sent for on February 25th. Found the patient blanched, and the bedclothes saturated with blood. This was the sixth time she had bled since Christmas. The vagina was full of clot, and the os, which was the size of half a crown, was covered by placenta. The vagina was plugged pending the arrival of more help. Meantime, the os became more dilated, and when the plug was removed the membranes were felt on one side. They were ruptured, and as the cord was prolapsed in front of the head, version was performed and a foot brought down. Ergot was now given, and a child born in about twenty minutes afterwards; it was dead. The placenta was expressed, and there was no further hæmorrhage. The patient was very weak, but rallied somewhat after giving brandy and egg, and injecting brandy subcu-

taneously. The extern remained to administer more brandy, but she sank in a few hours.

Case 19.—Age not stated; sixth confinement. She was said to be two weeks short of the full term of pregnancy, and had had some bleeding five weeks previously, which recurred five days ago. Patient was found rather weak and anæmic, the os slightly dilated, the placenta easily felt, and vertex presenting. Barnes's bags were used, and they apparently displaced the head. The membranes were ruptured, and version performed under chloroform. There was some difficulty with the after-coming head, and pulsation ceased in the cord; by jaw traction the head was delivered. Artificial respiration was tried for half an hour, when the cardiac pulsations ceased. The mother did well.

Case 20.—Age not stated; fourth confinement. Patient began to bleed when six months pregnant. She was put to bed, kept quiet, and given opium. Six days later, having got up against orders, she began to bleed again, and bled for ten hours before sending for help. She was blanched and pulseless; the os was dilated and the placenta presenting. Version was performed and a dead child delivered; there was no post-partum hæmorrhage. No ergot was given, but brandy, ether, eggs and brandy were administered all through the night and the following day. In the evening the patient was still pulseless, and Dr. Galabin performed transfusion. Her mother gave the blood. Ten ounces were drawn, and defibrinated before injection into the median basilic vein. There was no improvement in the patient's condition, and she died on the following morning.

Case 21.—Æt. 41; twelfth confinement. Patient was six months pregnant when hæmorrhage began. She was put to bed, and opium was given; the placenta could be felt at the os. A fortnight later, bleeding recurred; the os was dilated to some extent, and the placenta covered it entirely. Barnes's bags were used, and podalic version performed; the child was stillborn. There was no further hæmorrhage. Ergot was given and careful kneading of the uterus was kept up. In a few hours she became faint. Dr. Galabin saw her and decided not to transfuse, but in two hours he was called again and transfused from the husband's median basilic vein to

the patient's, directly. A clot formed and the transfusion was unsatisfactory. She remained in a very precarious condition, and developed phlegmasia dolens in the left lower extremity. Ultimately she recovered, but was weak and pale when last seen, six weeks after parturition.

Case 22.—Æt. 30; fifth confinement. At the beginning of the ninth month of pregnancy she had repeated losses; the os was completely covered by the placenta. Barnes's bags were used, and podalic version performed. Great collapse. Transfusion was discussed. The child was stillborn, though heart pulsated some time, and artificial respiration was kept up for nearly an hour. Mother ultimately recovered.

Case 23.—Æt. 36; twelfth confinement. Shoulder presenting. Edge of placenta could be felt. Considerable hæmorrhage. Uterus tightly contracted. The mixture of chloroform, ether, and alcohol was given, and version completed. A dead child was born. Mother did well.

Case 24.—Æt. 36; eighth confinement. Bleeding began, os was found undilated, and vagina full of clots. By the time further assistance arrived, the os admitted two fingers; the placenta could be felt completely covering it. Dr. Horrocks got his finger beyond the edge of the placenta, and ruptured the membranes. Under his direction, the senior assistant performed podalic version; the child was stillborn. The mother did well.

Case 25.—Æt. 29; sixth confinement. Pregnant eight months. Had one or two hæmorrhages before labour finally set in. Under Dr. Horrocks's supervision podalic version was performed; the child was stillborn. The mother did well.

Case 26.—Age not stated; sixth confinement. When the os was the size of half a crown, profuse hæmorrhage took place; the edge of the placenta could just be felt. A Barnes's bag was introduced, and the vagina plugged. Labour progressed favorably. The child was born without further bleeding, but was dead. The mother did well.

Ante-partum Hæmorrhage.

Under this heading is included all cases of bleeding at any stage of pregnancy before delivery, except those due to placenta prævia which have been already described. There are 82 cases, or 1 in 311, or 0·3 per cent. Ten of the mothers died, 7 from hæmorrhage, 2 from puerperal septicæmia, and 1 from rupture of the uterus. Details of 3 of the 10 cases have been already given (*vide* Cases 3 and 13, Post-partum Hæmorrhage, and Case 2, Rupture of Uterus). Of the 82 cases, 8 were before the sixth month of pregnancy, and resulted in abortion or miscarriage, whilst 74 occurred during the last three months of gestation (accidental hæmorrhage). Six of the seventy-four were delivered during the seventh month, when the child is non-viable, and the remainder, 68, were delivered during the last two months; of these viable children 36 were stillborn. There were 2 cases of twins, and one woman died undelivered (Case 11).

In many of the cases of ante-partum hæmorrhage there was also post-partum hæmorrhage. In some of the cases of so-called accidental hæmorrhage (*i. e.* during the last three months of gestation), bleeding began before the completion of the sixth month, but delivery did not occur until a subsequent date.

In the treatment of ante-partum hæmorrhage, each case has been dealt with on its merits, but the general principles may be here sketched. Where the hæmorrhage was severe, or when the patient was obviously weakened from the loss of blood, active measures have been at once adopted to stop the bleeding and deliver. When the bleeding has been slight or moderate in amount, or when the patient has been unaffected to any grave extent, the pulse being strong and under 100 per minute, an attempt has been made to stop the bleeding by rest, drugs, &c., without interfering with the progress of gestation. Where abortion or miscarriage has appeared inevitable, ergot has been given in some cases, nature has accomplished it alone in others, whilst in a few the uterus has been artificially emptied of its contents. In

the later months the membranes have been ruptured in some cases, and other measures adopted according to the requirements of the particular case; thus version was performed in 6 cases, and forceps were applied in 8 cases. The cervix has been artificially dilated when necessary by tents, the fingers, or Barnes's bags; the last were used in 8 cases.

In one case only was perchloride of iron used to stop the bleeding (*vide* Case 3, Post-partum Hæmorrhage), which came apparently from the cervix uteri.

Besides the three fatal cases which have been already published, four others, non-fatal, have been given, viz. Case 42, Forceps; Case 9, Version; Case 14, Upper Extremity; and Case 21, Post-partum Hæmorrhage. Details of some remaining cases of interest are given below.

Case 1. *Abortion at the tenth week.*—Æt. 27; sixth pregnancy. Came on bleeding at the end of the eighth week of gestation, and continued nearly a fortnight. On examination, the os was dilated, and the membranes could be felt. The finger was passed into the uterus and the membranes ruptured. The ovum and its coverings were all removed except a small piece of tissue at the top of the fundus. This could be touched, but the woman not being under an anæsthetic, the assistant could not reach sufficiently high to peel it off. The patient did well, and had no further hæmorrhage. The piece left behind came away in bits probably, as it was never seen. The uterus was washed out with a solution of permanganate of potash.

Case 2. *Carneous mole.*—Æt. 31; seventh confinement. Patient was three months advanced in gestation when bleeding began. The os was found dilated to some extent. Barnes's bags were used to dilate still further, and at the same time to stop the bleeding. Then a portion of the carneous mole was removed with the fingers. Ergot was given, and the remainder was expelled by natural efforts. The woman made a good recovery. Intra-uterine injections of permanganate of potash were used.

Case 3. *Accidental hæmorrhage.*—Æt. 25; third confinement. Had occasional hæmorrhage during the last three months of pregnancy. When labour began, the bleeding

increased. The patient got weak from loss of blood, and the os being fairly dilated the long forceps were applied, and a living child extracted. The patient did well.

Case 4. *Accidental hæmorrhage.*—Æt. 25; third confinement. Patient was kicked in the abdomen accidentally by a child in bed with her. In about twenty-four hours bleeding commenced along with uterine pains. She lost a great deal before sending for assistance. The membranes were at once ruptured, and the bleeding ceased. A large quantity of liquor amnii escaped, but it was many hours before the os became fully dilated. No instruments were used. The child was stillborn as were her first two children. Two large clots followed the child, and the placenta had evidently been detached at one part. The mother did well.

Case 5. *Abortion.*—Æt. 25; third confinement. Commenced bleeding after heavy lifting. Ergot was given and the ovum (two and a half months) was expelled with its membranes entire. There was no further loss, and she did well.

Case 6. *Hydatidiform mole.*—Æt. 30; ninth confinement, including one miscarriage at the sixth month. The patient commenced pregnancy with severe abdominal pains and amenorrhœa. Then she had a slight loss of blood which gradually increased, at first every second day, and finally continuous. The bleeding was more severe in the recumbent position and in the evening. She went to St. Bartholomew's Hospital, and said they told her she was "five months pregnant," and gave her some medicine. The bleeding continued, however, and at last she sent for assistance. The os was found to be the size of a shilling. A pulpy mass could be felt, and the uterus was as big as at full time of pregnancy. Thinking it was a case of placenta prævia, the assistants, in Dr. Galabin's absence, dilated with Barnes's bags, administered chloroform, and proceeded to empty the uterus. This they did and found no fœtus at all, but a hydatidiform mole. Dr. Galabin examined it afterwards. The mother did well.

Case 7. *Monster; Liver presentation.*—Æt. 30; seventh confinement. Membranes ruptured; os fully dilated; soft mass presenting; pains every five minutes. In the soft

mass was a depression into which the finger could be passed, and beyond the mass could be felt a sharp point of bone like knee or elbow. Whilst further help was being summoned considerable hæmorrhage occurred, the pains got stronger, and finally the child was born dead. It was found to have no abdominal walls, and there was a protrusion of all the abdominal viscera. The liver had presented, and the depression above alluded to was the portal fissure. The vertebral column was curved so that the heels touched the occiput, and there was a large spina bifida over the sacrum; the point of bone which was felt was the right hip. The funis was only two inches long, and the placenta was very large. The sex of the child could not be made out; it was normal in the upper half of its body except that the chest was narrow. The mother did well.

Case 8. *Accidental hæmorrhage; version; death.*—Æt. 24; third confinement. Between six and seven months pregnant, and had occasional hæmorrhage for a fortnight, when pains set in. The os was small, barely admitting a finger, the membranes unruptured, and the vertex presenting. The pains grew more frequent and stronger, but the os did not dilate well. There was not much bleeding, but the patient became exhausted. Chloroform was given and dilatation attempted by means of the fingers and Barnes's bags. In Dr. Galabin's absence Mr. Symonds came down, ruptured the membranes, and advised waiting. As soon as the os was sufficiently dilated bipolar version was performed under chloroform. A dead child was extracted with great difficulty; the placenta looked ragged at one spot. The mother died in twenty-four hours, her temperature rising to 103·4° F.

Case 9. *Ante-partum hæmorrhage; low forceps; death.*—Æt. 37; eleventh confinement. Bleeding commenced with a gush at 4 a.m.; the os was undilated. Twelve hours later ergot was given, and when the os was fully dilated and the head low down in the pelvis, the short forceps were used. The child and placenta came away together. The occiput was posterior. Some clots also came away. The patient was much exhausted, and her temperature gradually rose to 103° F. The uterus was syringed out with permanganate of potash lotion, but she

sank thirty hours after delivery. No autopsy was allowed. The child was stillborn.

Case 10. *Bleeding; forceps; death.*—Æt. 29; second confinement. The patient had some bleeding, and the os was undilated. Barnes's bags were used as soon as the os had become large enough. The woman had become blanched. Forceps were applied, and a stillborn child was delivered. The placenta came away without trouble or loss of blood. The patient was apparently getting along nicely until the following morning, when she asked for a drink, complained of severe abdominal pain, and died suddenly. No autopsy.

Case 11. *Accidental hæmorrhage; died undelivered.*—Æt. 46; thirteenth confinement. The patient was much upset by a family quarrel, and soon after, whilst making a sudden effort, felt a severe pain in her stomach. She woke up at one o'clock the following morning and found herself flooding profusely. On examination, the hæmorrhage had nearly stopped and the os was undilated. The vagina was plugged. In a few hours there was further bleeding, the patient was blanched and collapsed, and whilst Barnes's bags were being used she died undelivered.

Case 12. *Accidental hæmorrhage; death.*—Æt. 38; fourteenth confinement. Six weeks before delivery she had a fall, and lost a good deal of blood. Commenced losing again the day before delivery, and as it continued to an alarming extent, sent for help. The vagina was plugged until further assistance could be obtained, when, the os being moderately dilated, the membranes were ruptured; the breech presented. A leg was brought down and the child delivered stillborn. On the placenta were patches appearing like fatty degeneration. There was no further bleeding, but the patient was so collapsed that Dr. Galabin was sent for. Before his arrival she died.

Case 13. *Accidental hæmorrhage; death.*—Age not given; eleventh confinement. The patient having had considerable hæmorrhage and the pains being feeble, the forceps were applied, but they slipped off. The presentation could only be reached with difficulty. The child was expelled by natural efforts, breech first. The mother remained in a

weak condition for ten days, and then had a little bronchitis. She got up contrary to orders, and the next day was worse. She sank and died sixteen days after delivery.

Case 14. *Accidental hæmorrhage.*—Æt. 37; eighth confinement. When over six months pregnant had a fall, after which she did not feel the child move. Ten days later began to lose blood; this continued for two weeks, when labour pains set in. A bulging mass was felt *per vaginam;* it was seized and traction made. It proved to be loose scalp. The child was dead and decomposed. The uterus was syringed out with carbolic lotion. The mother did well.

Case 15. *Ante-partum hæmorrhage.*—Æt. 38; seventh confinement. The patient was very stout and very weak. The funis was prolapsed outside the vulva, and pulseless. Dr. Horrocks was called, and the long forceps were applied. A dead child was extracted. There was much bleeding during the operation. The mother did well.

Adherent Placenta.

The placenta was adherent in 84 cases, or 1 in 303, or 0·3 per cent. There were only 3 cases of hour-glass contraction of the uterus reported. In 19 cases there was bleeding before removal of the placenta; in 13 of these the loss was serious, two of the mothers dying (*vide* Cases 14 and 20, Post-partum Hæmorrhage). In 16 other cases there was post-partum hæmorrhage, but it is not stated whether this occurred before or after delivery of the placenta. In 49 cases the record as to bleeding is imperfect. In 4 cases there was ante-partum hæmorrhage; one of them was fatal. Out of the whole 84 cases there were 7 deaths. Two have been already mentioned; another died from bronchitis (*vide* Case 99, Forceps). In 10 cases there was puerperal pyrexia, and 4 ended fatally. Three of these fatal cases are already reported (*vide* Cases 10, 14, and 17, Post-partum Hæmorrhage), and the fourth is detailed below (Case 6).

In only 4 cases is the condition of the lochia mentioned. In each instance the discharge was foul, the uterus was syringed out, and the patient recovered. In many

other cases uterine antiseptic injections were used, though the lochia are not mentioned.

The hand was introduced into the uterus for the removal of the placenta in all the 84 cases, mostly under chloroform. Besides those mentioned, four other cases are already reported in detail (*vide* Cases 5, 16, 22, and 23, Post-partum Hæmorrhage). A few more are here given. One case in which the mother had smallpox is described under Zymotic Diseases (Case 1).

Case 1. *Tough placenta.*—Æt. 26; third confinement. The extern had broken off the cord and a piece of placenta in trying to extract the after-birth. It was found that the placenta was adherent and very tough, almost cartilaginous in consistency. It was removed with great difficulty by introducing the hand into the uterus, and peeling it off. There was considerable hæmorrhage. Ergot was given and cold water injected into the uterus; quinine and opium were administered. The mother did well.

Case 2. *Hæmorrhage.*—Æt. 40; eleventh confinement. The child had been born an hour, and bleeding had been going on slowly, but the placenta could not be expressed. The extern sent for help. The assistant passed his hand into the uterus, and had some difficulty in separating an adherent placenta, not so much on account of firmness of attachment as from the cramping caused by contraction of the uterus. There was no further bleeding, and the mother did well.

Case 3. *Miscarriage.*—Æt. 22; second confinement. The patient was dancing and fighting in a drunken brawl on Saturday night. Once during the fight she fell flat upon her belly. She was quite drunk. Early on Sunday morning bleeding and labour commenced. The membranes were ruptured artificially to stop hæmorrhage; the hand presented. Digital dilatation was carried out until a leg could be brought down. A five months' fœtus was extracted, after which it was necessary to introduce the hand in order to separate an adherent placenta. The uterus was cleared of clots, and ergot given. The mother did well.

Case 4. *Podalic version; premature labour.*—Æt. 36; fifteenth confinement. The patient had a blow on the

abdomen, and complained of pain for a fortnight, when premature labour set in. When the os was sufficiently dilated, the shoulder and cord were felt presenting. Chloroform was given, and version accomplished; a seven months' child was extracted dead. Bleeding came on, and the placenta, which was adherent, had to be removed by introducing the hand into the uterus. Ergot was administered, and cold water injections were given. There was an offensive discharge and pyrexia for some days, but the mother recovered under the treatment of opium, vaginal injections, and belladonna to the breasts. She still complained of pain in the abdomen.

Case 5. *Post-partum hæmorrhage.*—Æt. 30; fourth confinement. After the birth of the child, the extern had much difficulty with the placenta; he removed about three quarters of it. The junior assistant went down and removed a little more, but finding that there were bits left, he went for the senior. Chloroform was given, and all the remaining bits were detached and removed. The uterine cavity was washed out with carbolic lotion (1 in 60). There was a little pyrexia for two or three days, but the mother and child did well.

Case 6. *Forceps; puerperal fever; death.*—Æt. 37; fifth confinement. The waters had escaped about fifteen hours. The os was fully dilated, but the anterior lip was very œdematous, and the head wedged in a narrow conjugate diameter. The long forceps were applied, and a living male child was extracted. It was found necessary to introduce the hand into the uterus, as the placenta was adherent. The patient died on the fifth day from puerperal fever.

Induction of Premature Labour.

There is only one case in the maternity records in the present series, owing to the fact that these cases are generally admitted into the hospital for treatment.

Case 1. *Contracted pelvis.*—Æt. 26; primipara. The patient was eight months pregnant. She sent for help because of slight hæmorrhage. The pelvis was uniformly

contracted. Dr. Horrocks was sent for, and advised induction of labour. A celluloid bougie was passed seven inches into the uterine cavity, and tied in with tapes. It took three days to accomplish delivery. A living female child was born; mother and baby did well.

Eclampsia.

Only 11 cases are recorded, and the information given is scanty. Two cases were specially reported, and are detailed below.

In one case the fits came on before labour, in 4 cases during labour, and in 3 cases after delivery. In 3 cases it is not stated when the fits occurred. Only one mother died, and her child was stillborn.

In 9 cases the condition of the urine has unfortunately not been recorded. In one case it is mentioned as albuminous, and in another as not albuminous. There was a history of hystero-epilepsy in one case (Case 2).

Case 1. *Eclampsia during labour; chloroform; forceps.* —Æt. 20; primipara. The fits began at the same time as labour. They became frequent, and were epileptiform in character; the tongue was bitten and the face contorted; the pupils dilated and the patient was restless and unconscious. The os was dilated to the size of half-a-crown. Chloroform was given for an hour, during which time the fits ceased. The urine was drawn off and found to be highly albuminous. The pulse was 110, and the temp. 100·8° F. The uterine pains were frequent, and the head having reached the vulva the short forceps were applied and a living child was extracted. The patient had a slight fit half an hour after delivery, and the temperature rose to 101·6° F. Two drops of croton oil and five grains of calomel were given, as well as a mixture of bromide of potassium (fifteen grains) and chloral hydrate (ten grains); the latter was repeated every six hours. She remained unconscious two days, and then had another slight fit. On the following day she became conscious, and gradually improved until she got well. The child did well also.

Case 2. *Hystero-epilepsy; pilocarpine; chloroform; forceps.* —Æt. 35; eighth confinement. The patient was subject to hystero-epileptic fits, which were brought on by almost any excitement. When labour began the fits came on. She ground her teeth, clenched her hands, squinted (internal), and drew up her legs. There was no convulsion, but her eyes remained widely open, and saliva flowed freely from her mouth. Later, the legs became rigid. Fifteen grains of chloral hydrate and twenty grains of bromide of potassium were given three times at intervals of twenty minutes. Later, half a grain of pilocarpine was given by the mouth, and as no result followed, the dose was repeated twice at intervals of a quarter of an hour. After the third dose salivation became very profuse, sweating set in freely, the pulse became fuller, and the patient vomited. Chloroform was now given, and the os dilated with the fingers. Whilst under the anæsthetic the pulse became remarkably accelerated, 180 per minute. When the chloroform was discontinued it fell to 95 and immediately rose to 190 or 200, almost uncountable, when it was resumed. When the os was sufficiently dilated, the forceps were applied, and a living child was extracted. The mother and child did well, but the former had one fit, though not a severe one, after delivery. She took the bromide mixture every night for a few nights.

Puerperal Mania.

There were 9 cases, 2 of which proved fatal (Cases 5 and 6). No details are recorded in 2 cases. One case has been already reported (*vide* Case 8, Upper Extremity), and the remaining 6 cases are given below. It is of interest to note that nearly all the patients were young, the average age being about twenty-five.

Case 1.—Æt. 23; primipara. The confinement was normal, and the child alive. A week later she developed symptoms of insanity, was very excited, had a temperature of 104° F., and pulse 120; her bowels had been very constipated since parturition. Chloral was given, but she re-

mained sleepless, and had delusions and hallucinations chiefly of a religious character. After a few days she was ordered to an asylum, but soon after she got so much better that the transfer was not made. Relapsing into her former condition she was removed to an asylum about a fortnight after delivery. In less than three weeks she became quite rational. With the exception of a great-aunt who had some mental trouble following labour there was no evidence of insanity in the family.

Case 2.—Æt. 24; primipara. The mother was unmarried. Forceps were used to deliver; the child was alive. Ten days later she became excitable, and was removed to the workhouse infirmary, and a few days afterwards to the Brookwood Asylum.

Case 3.—Æt. 24; third confinement. The labour was normal, and all progressed favorably until the sixth day, when another of her children was found in the same room suffering from smallpox. Two days later the mother developed puerperal mania.

Case 4.—Æt. 23; fourth confinement. Forceps were used; the child was alive. A slight rupture of the perinæum was treated by one suture. Her temperature rose to 105° F. in a few hours, and she had uterine pains in abdomen. For eleven days she was pyrexial, and took twelve ounces of brandy and forty grains of quinine daily. The uterus was syringed out twice every day with carbolic lotion (1 in 60). On the fourteenth day she appeared to be all right, but on the fifteenth she became maniacal, attacked her husband, tried to kill the child, attempted to jump out of the window, and passed urine and fæces in bed. She was removed to an asylum.

Case 5.—Æt. 30; fourth confinement. Twins, male and female; both alive. Two days later, the mother became changed in her manner. She had no milk, refused food and medicine, was sleepless, and her temperature was slightly raised. The lochia were healthy but rather scanty. She would not speak but stared fixedly before her. At times she was excited, threatened to destroy her children, and saw visions of angels. She did not sleep for days, and died rather suddenly on the tenth day.

Case 6.—Æt. 35; seventh confinement. Five days before labour the patient was knocked down by a cart in the street. She was brought to the hospital bruised and cut, but as there did not appear to be any serious symptoms she was allowed to go home. The labour was protracted, and the child stillborn. Subsequently acute insanity came on, and she died ten days after parturition.

Puerperal Fevers.

All who have a practical knowledge of the diseases from which women suffer in childbed admit that different affections have been included under the single term *Puerperal Fever*. Some have gone so far as to say that all cases of this disease are septicæmic in origin, and propose to alter the title to *Puerperal Septicæmia*. Without venturing an opinion on this question, the term puerperal fevers has been adopted in order to include all those affections which have been hitherto grouped together under one title. As many facts as possible will be given, so that a differentiation can be made by anyone at any time. Thus it has been shown that a puerperal fever *with* a foul discharge differs in a most important respect from one *without* a foul discharge, in that the latter is much more fatal than the former; and when the offensive material has been removed by washing out the uterus or by other measures, the patient improves so certainly and so rapidly that it is argued she must have been infected by absorption of fetid materials, and the term *Sapræmia* has been employed in this sense. Nevertheless, in this report all the cases, whether with or without a foul discharge, are included, and the condition of the discharge is given as far as possible.

There were 61 cases of puerperal fevers, or one in 418, or 0·24 per cent. Forty-four were fatal, so that the mortality from puerperal fevers alone was 1·7 in 1000, or 1 in 579. In the last report the percentage was 1·7 per 1000, or 1 in 575. It is the rule to suspend an extern from his duties whenever one of his cases develops serious symptoms, but in 1884, during the absence of the assistant

obstetric physician, one of the externs was unwittingly allowed to hold the appointment of dresser in the surgery at the same time as well. No less than three of the women attended by him died of puerperal fever. He was suspended from his duties when the first case became ill, but he had already attended a few in the interim, and two more sickened and died. In 1883 an extern had five cases of puerperal fever in quick succession, and four of the women died. It must be noted that the externs are appointed for four weeks, and attend on the average over forty cases each.

In 27 cases there was peritonitis, and of these 21 died.

With regard to the influence of zymotic diseases in the production of puerperal fever, little can be said, but it may be mentioned that in one case a child with scarlatina was in the same room, and the patient had a high temperature for two days. This and other slight cases of pyrexia have not been included, but it is of course, a question how far we may have mild as well as severe examples of the same disease. In another case, a child in same room had smallpox, and the woman had puerperal mania (*vide* Case 3, Puerperal Mania).

The principles of treatment have been to remove any source of infection, to wash out the uterus and vagina according to necessity, and to give a purge at the outset along with opium and hot fomentations. Quinine in five-grain doses has been used in most cases to bring down the temperature. The suspension from duty for a few days of an extern when he has a case of fever has been already mentioned. Antiseptic measures have been adopted by the gentlemen in attendance. The surroundings of the patients are often of the poorest description, and the low mortality would almost indicate that dirt and poverty do not necessarily increase the risks of puerperal fevers.

Twelve cases have been already reported (*vide* Case 4, Forceps; Cases 2 and 8, Craniotomy; Case 1, Version; Cases 4, 8, 10, 14, and 18, Post-partum Hæmorrhage; Cases 1 and 17, Placenta Prævia; and Case 6, Adherent Placenta). In thirteen cases, of which 8 were fatal, there have been no special reports made. The remaining 36 cases are recorded below.

Case 1.—Æt. 21; primipara. The child was born alive, and thirteen days afterwards secondary hæmorrhage occurred, for which the mother was admitted into the hospital. A sponge-tent was introduced, and she died in five days from blood-poisoning. At the post-mortem a large flaccid uterus and a soft spleen were found.

Case 2.—Æt. 19; primipara. Labour normal. Temperature 101° F. on second day, pulse 140. Abdominal tenderness and pain. The lochia were rather offensive and scanty. The vagina was syringed out with permanganate of potash solution, and quinine and opium administered internally. She got worse, and died with symptoms of acute peritonitis on the fifth day.

Case 3.—Æt. 21; primipara. Labour tedious. She had œdema of the lower extremities and of the labia for some days before delivery. On the sixth day she became feverish. The lochia were offensive, and in spite of intra-uterine injections of permanganate of potash lotion and the administration of quinine she died on the tenth day.

Case 4.—Æt. 23; third confinement. Labour tedious. Forceps used. Developed feverish symptoms on the fourth day and was admitted into the hospital. There was considerable pelvic cellulitis. She recovered.

Case 5.—Æt. 20; primipara. Labour tedious. Forceps used. Fever set in on the fourth day; temperature 102° F.; the lochia were offensive. Quinine lowered the temperature but pneumonia set in and she died on the thirteenth day.

Case 6.—Æt. 25; third confinement. Both her previous children were premature and stillborn. She was only seven months pregnant and had not felt the child for a week. The feet presented, and the child was stillborn. On the third day she drank a lot of spirits with some friends and became very excited. On the fourth day she was seized with symptoms of septicæmia and rapidly got worse. She was moribund on the sixth day, when the friends called in a local doctor. No further information is given, but this case is included in the fatal ones.

Case 7.—Æt. 30; third confinement. Labour normal. Puerperal fever developed on the third day, and she died on the fifth day. The lochia were not suppressed.

Case 8.—Æt. 29; fifth confinement. Labour normal. On the sixth day the lochia ceased; sickness and pain in abdomen came on. Temperature 102° F. The fever continued in spite of antiseptic injections and medicine. On the eighteenth day phlegmasia dolens developed in the right lower extremity, and she died on the nineteenth day.

Case 9.—Æt. 22; second confinement. Labour normal. Lochia ceased on third day. Temperature 104·6° F. Antiseptic injections. Abdomen tender and tympanitic. Sickness severe. Continued to get worse, and died on the tenth day.

Case 10.—Æt. 36; eleventh confinement. Breech presentation; stillborn child. High temperature on the second day; died on the fifth day.

Case 11.—Æt. 19; primipara. Difficult labour; forceps tried in vain for an hour. Craniotomy performed; some post-partum hæmorrhage. On the following morning had general abdominal tenderness, which continued some days. On the twenty-fourth day a large abscess formed in the anterior triangle of the neck on the left side. It was opened under chloroform antiseptically, and afterwards she was removed into the hospital, where she ultimately got quite well.

Case 12.—Æt. 29; second confinement. Labour normal. Was in a filthy state and very dirty in her habits. Went on well until the twelfth day, when peritonitis set in, and she died in two days with symptoms of septicæmia.

Case 13.—Æt. 28; primipara. Perinæum ruptured. Sutures put in. Pyrexia on the fourth day. Stitches removed on the sixth day; the wound was healed. On the eighth day a red swelling appeared on the left wrist, and another on the right ankle (pyæmic ?). The fever continued, and she died on the tenth day.

Case 14.—Æt. 20; primipara. On the eighth day peritonitis set in. She was admitted into the hospital. The lochia were not offensive. She died on the sixteenth day. A post-mortem revealed acute peritonitis caused apparently by the rupture of an abscess in the right Fallopian tube. There was a small piece of placenta in the uterus.

Case 15.—Æt. 32; sixth confinement. Labour normal. Fever on fifth day. Purgative given. Pain in abdomen on seventh day. Lochia offensive. Antiseptic injections. Opium given. Vomited on the tenth day. Very ill on the eleventh day. Diarrhœa set in. On the sixteenth day she was comatose, and the evacuations passed in bed. Temperature subnormal; pulse almost imperceptible. The next day she was rather better, and the temperature was 104° F. A week later she was much better, and was considered convalescent on the twenty-sixth day. On the twenty-eighth day, however, she had an attack of erysipelas, which kept her in bed several days. She got quite well eventually.

Case 16.—Æt. 32; sixth confinement. Miscarriage; the fœtus had been dead some time. A fortnight after delivery she had pain, fever, and some pleurisy. No foul discharge. Was taken to the hospital, where symptoms of septicæmia developed, and she died six weeks after the miscarriage. At the post-mortem a small piece of placenta-like tissue was found in the uterus.

The following five cases were all attended by the same extern:

Case 17.—Æt. 34; tenth confinement. Stillborn child. Temperature 105° F. on third day. Lochia not offensive. Died on the sixth day.

Case 18.—Æt. 30; eighth confinement. Normal labour. On the third day temperature 105° F. Pyrexia continued high, and on the fourteenth day cellulitis appeared on the outer side of the left arm, which suppurated, and in a day or two an incision was made under chloroform. Half a pint of pus was evacuated; it was not offensive. After this she improved and quickly got better.

Case 19.—Æt. 32; third confinement. The patient had old hip-joint disease, and lardaceous degeneration. Labour was difficult and forceps were used. On the second day the temperature was 104·2° F., and she died on the sixth day.

Case 20.—Æt. 37; ninth confinement. Patient only seven months pregnant. Was in bed for four days before delivery. Temperature 101·4° F. on second day after delivery. Rapidly got worse in spite of injections and medicine. Was admitted into the hospital on the fourth day, and died on the fifth

day. There was a small piece of placenta in the uterus, pus in the cervical canal, and general suppurative peritonitis.

Case 21.—Æt. 22 ; primipara. Labour normal. Pain in abdomen on second day. Temperature 103° F. on third day. Antiseptic injections, &c. Vomiting, diarrhœa ; abdomen tense. Died on the seventh day.

Case 22.—Æt. 21 ; second confinement. Labour normal. On the second day there was some family bereavement, and on the third day she had a rigor. Temperature was 104·2° F. ; pulse 160, and there was tenderness in abdomen over the uterus. Lochia rather offensive. Antiseptic injections were used, but after two days she refused to allow this, and so the case was given up. A local doctor was called in, and he very properly insisted on the syringing, and she got well.

Case 23.—Æt. 31 ; thirteenth confinement. Considerable post-partum hæmorrhage. Hot and then cold water was injected into the uterus to stop it. On the third day temperature was 104° F. Rigors. Headache. Pain over the uterus. Lochia foul. Antiseptic injections. Brandy ; quinine ; opium. The temperature remained high for five days and then she improved. Gradually got well.

Case 24.—Æt. 20 ; primipara. Normal labour. Pyrexia on the third day. Lasted six days, and then she recovered.

Case 25.—Æt. 27 ; primipara. Labour prolonged. Forceps finally employed. Temperature rose the following day. Abdomen tender. Lochia sweet. Fever continued, and on the seventh day she was delirious, with a temperature of 106° F. She died the next day.

Case 26.—Æt. 21 ; primipara. Considerable post-partum hæmorrhage and ruptured perinæum. Pressure was kept upon the uterus for an hour, and several large clots were expressed. The perinæum was not touched, because she was so collapsed from loss of blood. Ergot and brandy were given. For ten days the patient did well, when the temperature rose to 105° F., but subsided in three days. She ultimately recovered.

Case 27.—Æt. 19 ; primipara. Some post-partum hæmorrhage. On the fifth day had pyrexia and severe pain in the lower part of the abdomen. Lochia offensive and

scanty. Antiseptic injections. In a few days she was all right again.

Case 28.—Æt. 21; second confinement. Labour normal. On fifth day fever set in. Temperature 105° F. Antiseptic vaginal injections. No abdominal tenderness. Lochia scanty but not offensive. Broncho-pneumonia set in, and she died on the twelfth day.

Case 29.—Æt. 23; third confinement. Five hours after labour a large clot was expelled. The temperature varied from 103° to 99° F. during the first ten days. Then she got much worse, abdomen tympanitic and tender at the lower part; the uterus was fixed by effusion into both broad ligaments. Lochia not offensive. She was admitted into the hospital and pneumonia set in. Later she got thrombosis in the veins of the legs, with much pain and swelling. She gradually recovered, and got up on the sixtieth day.

Case 30.—Age not stated; fourth confinement. Labour lingering. On the third day urine had to be drawn. On the fourth her temperature was raised. Pain in abdomen. Tympanites and vomiting followed. She died on the tenth day.

Case 31.—Age not stated; sixth confinement. Labour normal. Rigors on the third day. Temperature 104·8° F. Abdominal tenderness. Considerable uterine enlargement. Antiseptic injections used. Salicyl. Sodæ given. Got worse day by day, and died on the eighth day.

Case 32.—Æt. 29; fourth confinement. Labour was normal, but there was a lump in the left labium which she had had ever since her last confinement, and which had got gradually larger during the last month. It suppurated and was laid open, discharging a quantity of pus. She was subsequently removed into the hospital, but died on the fourteenth day.

Case 33.—Æt. 29; fourth confinement. The labour was lingering, and the temperature rose to 102° F. before delivery, which was accomplished by the use of Barnes's bags and forceps. Fever continued, and abdominal tenderness developed. Antiseptic injections were used, but she got worse, and died on the eighth day.

Case 34.—Æt. 21; second confinement. Pyrexia on the

second day. Antiseptic injections. Purge given; lochia sweet. She improved and relapsed several times in eighteen days, but finally recovered.

Case 35.—Æt. 39; fifth confinement. Labour normal. Abdomen painful and distended on the second day. Temperature 101·2° F. on the third day. Rigors. Antiseptic injections. Fourth day lochia suppressed. Fifth day vomiting. Sixth day sinking. Pulse imperceptible. Cold hands. Death.

Case 36.—Æt. 33; fifth confinement. Labour normal. On the fourth day slight febrile symptoms. Could not suckle owing to retracted nipples. Had received a fright through one of her children falling into the fire. The surroundings were very wretched, and her husband was a drunkard. She complained of pain in the abdomen, particularly in the right ovarian region. The lochia were scanty and slightly offensive. She was syringed with a solution of permanganate of potash, and ordered quinine and opium. On the fifth day she was a little better. On the tenth day there was a recurrence of febrile symptoms, pain in the left shoulder-joint, one of the knee-joints, and in the limbs generally. She showed symptoms of blood-poisoning and bronchitis supervened. She was so neglected that it was deemed advisable to remove her to the hospital. This was done on the fifteenth day. She died two days later. At the post-mortem examination pus was found in the left ovary, left shoulder and knee, and in the cellular tissue on the right side of the neck. The placental site was inflamed, and the uterine venous sinuses were filled with pus and blood.

Zymotic Diseases.

Seven cases of zymotic disease are recorded; 3 of small-pox, 2 of scarlet fever, and 2 of erysipelas. Five cases recovered, and 2 died (Cases 2 and 4).

How far the puerperal state modifies the action of a specific fever has not been determined. From the few cases here recorded no conclusions can be drawn. Nevertheless, one may say that the characteristic phenomena of a specific

disease may be present in the puerperal condition. Details of the seven cases are given below.

Case 1. *Smallpox.*—Æt. 20; second confinement. Temperature 104° F. before delivery. Suspicious blotches on the abdomen, but no other evidence of specific fever. Barnes's bags used, forceps applied, and delivery accomplished. A second child was now felt, the breech presenting. The legs were extended and the hand was passed a long way into the uterus to reach a foot; this was brought down and the child delivered. The placentæ were adherent and had to be peeled off. The next day the temperature was 102·7° F., and papules and vesicles appeared on the backs of the wrists and forearms. Some papules also were on the hips, back, and buttocks. Later the face was covered with papules, many of which were confluent. She was removed to Stockwell Smallpox Hospital, and when last heard of was going on well. The children progressed favorably and had no trace of smallpox up to twelve days after birth, when they were last seen.

Case 2. *Scarlet fever.*—Full details have been already given of this case (*vide* Case 17, Post-partum Hæmorrhage). The patient died.

Case 3. *Erysipelas.*—The patient had an attack of erysipelas on the buttock and right thigh on the twenty-eighth day after delivery (*vide* Case 15, Puerperal Fever). She recovered.

Case 4. *Erysipelas.*—Fully reported (*vide* Case 18, Post-partum Hæmorrhage). The patient died.

Case 5. *Scarlet fever.*—Age not stated; fifth confinement. Male child born alive. The patient had scarlet fever after delivery, but no particulars are given, except that she recovered.

Case 6. *Smallpox.*—Æt. 26; second confinement. Male child, born alive. Developed smallpox on the day after delivery, but ultimately recovered.

Case 7. *Smallpox during pregnancy.*—Æt. 37; sixth confinement. The mother had smallpox two months before delivery. The child was born alive.

Maternal Mortality.

There were 86 deaths, or 3·4 per 1000, or 1 in 296. In the last report the percentage was 4·4 per 1000, or 1 in 223. Considering the poverty and destitution of most of the women, attended with the bad hygienic surroundings, this reduction of an already low mortality is very satisfactory. It is due, in some degree at any rate, to the increased use of antiseptics, and the cleanliness connoted by that. Some of the deaths were due to causes other than labour and the puerperal state, although in a few cases delivery may have hastened the fatal termination. In the Table given below it will be seen that the group of diseases included under the term puerperal fevers was the cause of 44 of the deaths. Hæmorrhage comes next, with 16 deaths. It must be noted that in several cases of hæmorrhage the patients developed symptoms of fever, and so have been included in deaths from puerperal fevers. Five deaths were due to rupture of the uterus.

Table of Fatal Cases.

Puerperal fevers	With peritonitis	21	44
	Without peritonitis	11	
	With pyæmia (1 had post-partum hæmorrhage)	2	
	With ante-partum hæmorrhage	2	
	With post-partum hæmorrhage	3	
	With placenta prævia and hæmorrhage	3	
	„ „ phlebitis	1	
	With accompanying lardaceous disease	1	
Hæmorrhage	Placenta prævia	4	16
	Other causes	12	
Scarlet fever and post-partum hæmorrhage			1
Erysipelas „ „			1
Rupture of uterus or vagina (1 case had placenta prævia)			5
Heart disease			4
Bronchitis			3
Pneumonia			2
Eclampsia			1
Cæsarian section			1
Puerperal mania			2
Not given			6
			86

Four of the above fatal cases which have not been included under other headings are recorded below.

Case 1. *Cæsarian section.*—Æt. 30; second confinement. At her first confinement three years previously, craniotomy was performed, and owing to the lingering labour a vesico-vaginal fistula resulted, together with other injuries. She was admitted into Guy's, but left without deriving much benefit. The parts became contracted and cicatricial. She was in labour for three days on the present occasion before it was discovered that she had got atresia vaginæ. The forefinger could only be passed about an inch up the vagina, it was so much contracted by dense cicatricial tissue. The patient was in an exhausted condition, and vomiting. She was with difficulty persuaded to come into the hospital. She was brought in a cab, and Dr. Galabin performed Cæsarian section. Chloroform was given at first, but ether was substituted after a while. The child was dead and very much decomposed. There was a great deal of hæmorrhage, which could not be controlled. Various plans were tried, pressure, ice in the uterus, ergotine injections, and the application of perchloride of iron by means of a sponge. The bleeding then partially stopped, but the patient's pulse rapidly failed. Ether was injected subcutaneously. A continuous cat-gut suture was put into the uterine wound, but whilst the abdominal incision was being sewn up the patient died.

Case 2. *Bronchitis.*—Æt. 32; fifth confinement. She had suffered for some years from bronchitis every winter. At the time of her labour (in the month of January) she had a cough. She went on well for ten days, when the bronchitis became acute, with quick breathing, feeble rapid pulse, and cyanosis. She died the next morning.

Case 3. *Drink; pneumonia.*—Æt. 41; tenth confinement. The labour was normal, and the child alive. The patient was a bronchitic, flabby, unhealthy-looking Irishwoman. She did well for three days when the lochia became rather offensive, and the temperature rose to 103° F. She was given quinine and opium, but refused to be syringed. That night she and some friends got very drunk, and the next day she developed acute pneumonia. The greater part of

the right lung was consolidated, and she died before she could be removed to the hospital.

Case 4. *Pleuritic effusion (?) ; Pulmonary embolism (?).*—Æt. 30 ; seventh confinement. Was delivered of twins and lost a good deal of blood. She went on well until the eighth day, when she felt faint and ill. On the following day she got up for the first time to have her bed made. Immediately after getting out of bed she was seized with dyspnœa which quickly got worse, and she then fainted away. Help was sent for, and she was found breathing quickly but in a very shallow manner, with a feeble and almost uncountable pulse (190). Temperature 106° F. She was in great pain about the chest and over the uterus, and was vomiting almost continuously, being nearly unconscious. In a short time the respirations sank to eight or ten per minute, pulse and temperature as before. She became pallid, and apparently moribund. Over the pulmonary artery could be heard a loud bruit. There was dulness and an absence of breath-sounds over the lower lobe of the left lung. Cold cloths were applied to the abdomen, and two ounces of brandy given. During the day she passed a large blood-clot, and in the evening appeared to be much better. Temperature normal, and pulse 120. The lochia were offensive. Occasionally she had a rigor with vomiting, each rigor being accompanied with a rise of temperature, on one occasion to 106° F. and on another to 105° F. Quinine was freely administered. She had attacks of dyspnœa similar to the first on two subsequent occasions, one on the sixteenth, and another on the twenty-first day after labour. On the thirty-second day the lochia had ceased, and the os was closed. The bruit was still heard over the pulmonary area, and also at the apex and round the axilla. She complained of pain in the side, where a pleuritic rub was heard. She could only lie on the left side, as she otherwise had a choking sensation. She died on the thirty-ninth day. An autopsy was refused.

THE TREATMENT OF SCOLIOSIS BY SAYRE'S METHOD.

By C. H. GOLDING-BIRD.

After more than ten years' experience of the treatment introduced by Sayre for spinal disease, it may not be out of place in these Reports—and the more so since on two occasions Sayre himself demonstrated his *modus operandi* in our operating theatre—to offer some purely practical remarks upon his method, and the results that I have obtained from it.

I propose here only to deal with that form of spinal disease known as scoliosis or lateral curvature; and since the arguments for and against his method in this malady are quite different from those in the case of spinal caries, no inferences must be drawn in respect of the latter from what may be said of the former; and no further reference will be made to caries, since I have elsewhere explained the value of the plaster-jacket treatment in that disease.[1]

From amongst cases of scoliosis to which this line of treatment is applicable must be removed three which are not altogether uncommon. One is that class of deformity, often slight, but still evident, and not as a rule calling for relief, which is seen in adults, the results of porterage, or of one-sided heavy employment. Mr. Arbuthnot Lane[2] has given special attention to the etiology and pathology of these cases; but therapeutically there is nothing to be said about them; they need therefore no further mention here.

[1] 'Dictionary of Surgery,' Christopher Heath.

[2] 'Guy's Hospital Reports,' 1887.

Then comes a class depending upon chest disease, the spinal curvature being secondary to alterations in the shape of the chest walls such as that induced by an empyema; and whatever value for a time a rigid support may have for these cases, no course of mechanical treatment is feasible.

Lastly, there is a fairly common type of lateral curvature, not unfrequently overlooked, or rather mistaken, in which the surgeon, only regarding the state of the spine, will be at once led to a wrong conclusion in regard to it, and probably adopt a line of treatment for it, both alike disastrous to the patient; they are cases where the two legs are of different lengths. I have more than once seen cases that have for lengthened periods been actually treated for spinal curvature, with apparatus, &c., under the impression that the malady was primary scoliosis, when a very simple examination demonstrated the secondary character of the deformity. I will briefly here quote a case that quite recently came under observation, and will illustrate not only the fallacy into which one may fall in diagnosis, but indicate the points to which attention must be paid to avoid error.

J. J—, æt. 18, a particularly healthy-looking country lad, was sent to me for an opinion, his doctor, under whose notice he had for the first time only just come, having observed he was suffering from marked scoliosis, though until a month before the parents had observed nothing wrong! I was at once struck with the lad's appearance; he was ruddy, muscular, and in thoroughly good health, so opposite to what one expects to see ordinarily in scoliosis. This at once suggested symptomatic or secondary curvature. I placed him erect before me, and stooping down placed a finger of each hand on the anterior iliac spines. The eye at once recognised that the left iliac spine was one and a quarter inches below the right one; and this was confirmed afterwards with the tape.

On being questioned, the father now for the first time recollected that as an infant the lad had broken his left thigh; yet without a thought he had been allowed to grow up with one leg shorter than the other, until he had developed into almost one of the worst cases of lateral curvature I have ever seen. Viewed from the front, his pelvis seemed sidling off to his

left, so that a perpendicular from the umbilicus fell over the left knee; posteriorly, there was extreme convexity in the lumbar region to the patient's left, and to the right in the dorsal region, with huge posterior projection (rotation) of the right ribs and scapula. On putting his feet together and placing a block one and a quarter inches thick under the left foot, the upper part of the trunk at once fell into its proper perpendicular and the iliac spines became level; the whole curvature much improved, but the rotation remained unaltered. Of course here the obvious treatment was a thickened sole to the left boot; not, however (as is often done), merely to the heel of the boot, but a uniform increase of the sole-thickness all along, in this instance one and a quarter inches in excess of that of the right side. In thickening a sole thus it is of great importance to avoid excessive weight, as well as such a shape as shall necessitate a patient stumping rather than walking along. This last may be brought about by giving the underside of the thick sole a curve from before backwards, so as to be canoe-shaped in outline; an easy roll is now given to the step, instead of the awkward stumping gait.

I make it a habit in examining all cases of lateral curvature—and it has saved me from mistakes—to observe the levels of the two anterior iliac spines. Stooping in front of the patient and placing a thumb on each spine, a difference of level of less than a quarter of an inch can be at once detected, even through the clothes, and the tape in the usual way will confirm this earlier observation.

The greater number of these cases of disparity in the length of the legs will be found to be due to old hip disease (omitting those cases where a surgical operation has been performed on hip or knee, and the shortening already known), and to that form of early infantile paralysis which affects the nutrition of the bones as well as of the muscles.

In the case just quoted, considering the age of the patient and nature of the shortening, the difference of one and a quarter inches will be always the same; but that rule does not hold in cases of infantile paralysis; the shorter paralysed limb does not, even after successful treatment, necessarily grow *pari passu* with the sound one; hence the necessity of

watching these cases for a long time. Such a condition is well illustrated by a case of a young lady, æt. 12, whom I saw in 1879 for the first time. For two years she had been under the treatment of a well-known orthopædic specialist for lateral curvature. When I saw her, her appearance suggested that the curvature was likely to be secondary, and a careful examination showed a difference of nearly half an inch between the lengths of the two legs due to early infantile paralysis. A block of that thickness placed under the shorter leg at once caused the curvature, which was very slight, to disappear; and a boot altered to these requirements was ordered. Six months later the difference in measurement was the same, and nothing remained of the scoliosis but a slight asymmetry of the loins. By 1884 the disparity between the two measurements had increased to nearly three quarters of an inch, and when last seen at the age of eighteen years it remained the same. The back was quite normal.

The rational treatment of scoliosis is intimately connected with its *cause*, and if this latter cannot be removed or modified, the extent of the treatment is proportionately limited.

In all cases the *cause is partly mechanical, partly constitutional.* The former all young people are subject to without exception, but it is only in the weakly subjects, and especially in those with a family history of the malady, or of flat-foot or knock-knee, or some other condition of "relaxed ligaments," or of poor muscular or rickety condition, that the temporary and often recurring mechanical state gives rise to a permanent disability.

Thus in a case now under observation in the hospital, the girl's father was a teacher of science in schools; he killed himself before he was forty with overwork; begat a daughter "all head and no body;" a quick, nervous, and for her station in life, intellectual girl, who at sixteen years of age has not the muscular development of a girl of twelve. Latterly she has spent her days in a Board school, class teaching, and doing most of her work "standing at ease" before her class; and after a twelvemonth or so of this she has developed a very marked lateral curvature, a permanency

of the position she was in the habit of assuming as one of rest when standing at her duties.

The *mechanical causes* to which all young people are subject are perfectly defensible from a physiological standpoint, but like other good things may be too much indulged in and abused. It is a requirement amongst animals generally that they should be able at will to take strain off their highly-organised muscular tissue and throw it upon structures of the connective-tissue type, whose office is rather mechanical than vital. Thus to stand at ease is to project the great trochanter against the stout fascia lata by the sinking of the pelvis of the same side, and thus let that structure endure a strain which is both injurious as well as unbearable to muscles after a short time. But this very position, if long indulged in, becomes a cause for permanent deformity; the pelvis falling on the side on which the patient halts, say the left, the lumbar spine curves to the same side, and to bring the trunk over the centre of gravity a compensating curve in the opposite direction appears in the dorsal region. Thus a temporary curvature is formed, and if repeatedly indulged in by the weakly—and it is they who feel the benefit of this position—permanent alteration of the intervertebral discs and of the vertebral bodies will follow with corresponding permanent deformity.

The same remark applies to all lazy and lounging positions, whilst the practical deduction is not to let the patient indulge unduly in such physiological luxuries, and to make him do his best to develop his muscular system and improve his general health, that the exaggeration of muscle-sense, the muscle pain of weariness, shall no longer be master, and necessitate the prolonged assumption of vicious positions.

Of cases of primary scoliosis the surgeon may expect to find them fall under one of two health groups of young people, and these mostly female. In one the nervous system seems developed far ahead of their muscular physique, and not a few are taller than the average at the same age. They are restless, quick, excitable, and it is with great difficulty they can be made "to take things quietly." They work as they play to the last stage of exhaustion, and come

in after a walk and throw themselves down in a perfectly "limp" condition; or, taking a book, sit in a low chair with knees to chin, and sinking the trunk to a position of physiological rest—telescoping, as I term it—maintain, whilst resting, a perfect position of lateral curvature with probably the whole spine bowed forwards at the same time.

Less frequently do they belong to the heavy indolent class, whom nothing short of an earthquake will move, who cannot be made to see the importance of their malady and its cure, even when put on the sole ground of self-interest; who loll about the house, hate out-of-doors exercise, and if they take a book will as often as not stand at ease to read it against the window-frame or chimney-piece. Their very indolence is a bar to the surgeon's successful efforts.

Scoliosis due to rickets may go with any temperament as far as I have seen; and where curvature commences early in childhood—I have treated one case under a year old—or where a child of say only seven years of age is brought with perhaps a history of the disease only being just observed, yet with curvature severely and incurably present, rickets will prove to be the cause. Considering the universality of rickets it is perhaps strange that more cases are not traceable to it; but the explanation may be the same as that given by Bland Sutton for the infrequency of paraplegia in rachitis in the human subject, whilst it is so common in a juvenile lion life; and that is that the vertebral epiphyses in man are insignificant.

Sayre introduced into the surgical therapeutics of spinal disease two distinct features; one the possibility of giving support to a weak back, infinitely superior to that afforded by the now old-fashioned "spinal supports;" the other the daily correction of the deformity by extension, which affords at the same time a healthy exercise for the musculature of the trunk, upon the improvement of which the permanency of the cure depends.

At first, all cases alike were thrust into plaster-of-Paris jackets; but it did not require long experience to demonstrate two points in regard to these supports: one that totally unsuitable and incurable cases were treated to their

eventual bitter disappointment; the other that the extreme, perfect, and rigid support afforded by the plaster jacket was almost more than curable cases of lateral curvature required, though no more than necessary for such physiological rest as is compulsory in cases of caries of the spine. For, granting the case to be one in which relief could be afforded, it was found that when put up in the plaster jacket the improvement was such that the patient immediately stood one to one and a half inches higher than before,—an apparent benefit; but after, say, ten to twelve weeks, when the jacket was removed, neither this nor a major part of this artificially produced height was maintained, and the amount of straightening or height increase that was actually gained was no more than can be guaranteed with a less rigid and certainly less irksome appliance.

Support in whatever form must, from the nature of the requirements for cure, be always a minor element in the treatment, and unless steps are taken to ensure improvement in muscular tone and general health, be actually detrimental. I have never treated a case of scoliosis without distinctly explaining this, and making it a *sine quâ non* that some suitable daily exercise such as that prescribed by Sayre shall be conscientiously carried out.

Is support then of any use in scoliosis? I unhesitatingly answer yes, in many cases; but hardly that of the immovable plaster of Paris; some well-made laced corset of stiffened felt, closely fitting, constantly worn by day and removed at bedtime, suffices; it gives ample support, whilst being less "skin-fitting" it allows rather more play for the trunk-muscles. Where not obtainable, a plaster or any other form of jacket can be moulded on to the patient when in the extended position, and eventually cut up, eyelet-holed, and laced on.

Whilst all cases of scoliosis require regular exercise of some form or another, alternating with rest, only a certain class need mechanical support; which these are will be seen in the classification about to be given. Here it may be as well to remember that the generally accepted rules as to matters of hygiene, including the amount of exercise taken, feeding, and the occasional use of tonics, especially ferruginous

ones, must be obeyed; just as in any other malady where the restoration of the patient to the normal standard of health is the main object.

The *method of examination* of a patient with scoliosis must be methodical, and in the case of Sayre's swing it is somewhat peculiar. In regard to this latter it is not necessary to give any detailed description of apparatus[1] but to say that by the "swing" is meant an arrangement of pulleys, &c., so that one end of a cord being held in the patient's hands the other is in connection with a system of pulleys which are fixed overhead, and to which is attached a crossbar-bearing headband; so that when that patient pulls on the cord and puts the headband on the head she can raise herself off the ground, her weight being sustained by the arms and by the head simultaneously.

In examining a patient the clothes must be so arranged that the back is exposed as far down as the iliac crests, so that the loins can be seen. The primary curve is in the lumbar region, and if the curvature is so slight as at first even to escape observation, yet the want of symmetry in the loins is always at once recognisable. Attention must be given then to the lumbar spine, the outline of the loins as seen from behind, the dorsal spine, the scapulæ and ribs underlying them, and the level of the shoulders, not omitting in any case of doubt an examination of the levels of the anterior iliac spines as already described.

Suppose the case to be a mild one, say due to halting on the left leg, the following will be seen. The lumbar spine is convex to the left, half an inch or less out of the vertical; the left loin is convex, the right concave, with perhaps, in the latter, a commencing horizontal crease or fold in the soft parts. The left erector spinæ is more prominent and feels harder than the right. An imaginary vertical dropped from the seventh cervical vertebra will fall, in the lumbar region, to the right of the spine, in the dorsal to the left of it; and between the two it will touch the spine at a neutral point between the lumbar and dorsal curvatures. This latter curve is compensatory to the lower one, and is in the opposite direction, and thus the spine gets its characteristic letter S

[1] 'Spinal Disease and Curvature,' J. Lewis Sayre. Smith and Elder, 1877.

shape. The angle of the right blade-bone will project posteriorly unduly, and between its posterior border and the spine the ribs are more easily felt than on the opposite side; they feel and appear to be thrust backwards, and hence the projection of the scapula. A corresponding flattening of the chest anteriorly on the same side will be seen. This is so-called "rotation;" hence the name, rotary-lateral spinal curvature, at times employed. The explanation of this symptom is that when the spine becomes convex to one side the tissues between any two vertebræ yield in an unequal degree; the intervertebral disc in front yields more than the interspinous tissues behind, and hence the front part, for a given force, bends more than the back part; and the more marked the curvature the more the backward movement of the transverse processes, which in the loin push backwards the erector spinæ, and in the dorsal region the ribs with the scapula resting upon them.

On the arms being now crossed over the chest the deformity becomes more plainly seen from the increased tenseness of the skin, and on stooping will be still more so, although this position, from the strain on the spine, tends to improve curvature, and if the latter be very slight indeed it may thus for the moment become obliterated.

The patient should now be examined in the "swing." The headband being adjusted, the patient seizes the rope, and with the arms as fully extended as possible over the head, pulls, hand over hand, till the feet are just off the ground, remembering that at that moment *the hand on the opposite side to that of the prominent scapula is to be the higher.*

All the deformity now lessens and may even disappear; the shoulders become level, the curvature diminishes, the loins become symmetrical, or nearly so, the scapula falls back into its place in proportion as the rotation recedes, and it is this rotation that last disappears, both on examination and in the course of treatment.

The reason of this improvement on suspension is simply that the weight of the head and shoulders is taken off the weakened spine, while that of the lower extremities becomes an extending force below.

Generally the higher shoulder is that of the side of the

projecting scapula and rotation, though there are exceptions; but, whether or not, the maximum benefit on suspension is seen when the arm of the side opposite to that of the outgrowing blade-bone is higher. The reason is that the convexity of the dorsal spine, which is on the side of the projecting scapula necessarily, is directly influenced by the pull of the opposite arm against the concavity during suspension, and thus the curve is diminished; and whilst usually the higher shoulder is on the side of the rotation, cases are seen where this is not so; and indeed in some very "flexible" patients they never seem to stand twice alike, hitching up first one shoulder and then the other.

Sometimes the characteristic **S** shape of the curvature already mentioned is not seen, at least on superficial examination, for there are cases in which the primary lumbar curve may reach so high as to be really a single lumbo-dorsal one, its upper end involving the scapular region, and hence producing the anomaly of the rotation of both lumbar and dorsal spine, with elevation of scapula on one and the same side. The compensatory curve above is very short and may be overlooked; the shoulder that is carried the higher is the one towards which this secondary curve is convex, and therefore on the opposite side to the outgrowing scapula.

Now, whilst the foregoing description suffices for an average case of scoliosis, many are seen of both less and greater severity, and to describe each of these is not my purpose here. I have, however, after a careful perusal of my own cases, come to the conclusion that, at least as far as Sayrism is concerned, we may classify cases of lateral curvature both with a view to prognosis as well as to present treatment. Such a classification as I am about to propose for working clinical purposes I have found reliable, and it is the one under which I shall presently analyse my own results.

Cases of scoliosis may then be ranged clinically in *three classes*. The *first* includes those in which a cure is obtainable; the *second* those in whom relief, more or less perfect in degree and durability, can be promised; the *last* embraces the incurable degrees of the disease, but for all that not the less deserving of, and suitable for, surgical assistance. They can

be much aided out of their invalid condition and helped to remain useful units in society, for, though cripples, they need not be downright invalids, and whilst treating such a case professionally the surgeon can do much to give the moral backbone that elevates the invalid to the comparative dignity of cripple.

Class 1.—Average age ten to nineteen years, save when caused by rickets. History of generally less than a year, but may extend to two years; if beyond, it is only in 10 per cent. to 15 per cent. of the cases of this class. Primary lumbar curve less than half an inch from the middle line, and there is hardly any loin crease on the side of the concavity. The scapular angle projects but slightly on the side of the dorsal convexity, the posterior rib projection (rotation) is visible, but often better felt than seen; on the same side the shoulder is elevated. Bent down, with the arms across the chest, the spinal curvature lessens or nearly disappears, and the muscular effort of standing erect in a forced manner similarly improves it. In the swing all deformity disappears; the loins are symmetrical and the scapula falls flat, and the shoulders become straight. If any trace of deformity remains it will be that of rotation.

Up to this degree there are all grades. The simplest is that where the dressmaker (generally) is the first to discover a want of symmetry in a projecting scapula ("outgrowing shoulder"), or in one shoulder being slightly higher than the other. Sometimes a gnawing or burning pain under one blade-bone when the patient is fatigued, first draws attention to the back. In such early cases the eye of the laity will fail to discover any curvature or asymmetry, unless first pointed out by a skilled hand.

Class 2.—Average age fifteen to twenty-five years, the greater number being between fourteen and seventeen inclusive. History of two to four years. Primary lumbar curve over half an inch from the middle line, and there is on the concave side a marked loin crease and concavity, and corresponding bulging on the opposite side. All the other symptoms detailed in Class 1 are accentuated, though the unevenness of the shoulders is not more than in the milder cases. In the swing all deformity considerably lessens, but,

except that the shoulders become level and the loin crease disappears almost entirely, the normal shape is not as a rule fully restored.

Class 3.—This is composed of cases to which the word "deformed" or "cripple" is applicable, the disease being usually of many years' duration, though in the case of rickets this degree may be reached even in childhood. The general complaint is of a feeling of weakness in the back, preventing the patient getting about, of "oppression at the chest," palpitation, and (mechanical) indigestion, and not unfrequently intercostal neuralgia low down on the side of the lumbar concavity. Examination at this point will show the intercostal spaces much narrowed and the ribs pressing one against the other, or even on to the iliac crest, and hence the pain. All the objective symptoms in Class 2 are present, aggravated and permanent; and suspension in the swing only relieves the feeling of chest oppression and the other subjective symptoms of the deformity. This is, of course, due to the opening up of the curvature for the time, but to the eye the deformity is almost as marked as ever.

Treatment of these Classes.

Though I have in the main followed Sayre in my treatment of scoliosis, yet I have found it advisable to modify it at times both in routine and character; while it need hardly be said, there are some cases of lateral deviation so slight and of so transient a character, that almost any treatment that has for its end the improvement of the general health and the avoidance of over-fatigue will suffice to effect a cure in a few weeks.

Taking the cases in the classified form I suggest, it will be found that Class 2 is that in which Sayrism in full is of greatest service, excepting in my opinion the over-rigidity of the immovable plaster jacket; his calisthenics leaving nothing to be desired. The plaster jacket, cut up and laced, or a rigid felt one is, I now think, preferable to that first proposed by him.

Presupposing that, as of primary importance, the general health, hygienic surroundings, social conditions, are as nearly as possible brought up to the normal standard, the mechanical part of the treatment may be thus indicated.

Class 1. *Treatment; after-treatment.*—The mildest forms of curvature, as just stated, may be really cured on "general principles." The patient should rest on a flat couch, rising only for meals or necessary purposes, and also for a morning or afternoon walk or both, the length of it being regulated by the simple rule that it is never allowed to induce a sense of weariness, nor bring back an ache or pain of which there may have been previous complaint. After the month the lying down may be reduced to two hours morning and afternoon, with this proviso, however, that after being up, indoors or out, sufficiently to produce any feeling of weariness, rest shall again be taken in the supine position, and on no account by lounging in an easy chair. In fact, sitting is still best avoided save at meals. With a weak back sitting is work, not rest. The exercise of such common-sense rules will suffice to cure many mild forms; and especially those with a short history—as of, say, a month or two—and accompanied by a constant complaint of lassitude, back weariness, if not actual pain. It is wonderful the way in which these weakly "pumped-out" people recover when enforced idleness is the rule.

But if the case of this class be more severe, in addition to the above—which may have to be modified or prolonged on common-sense principles—some support on getting about, and regular calisthenics, must be employed.

As to supports, a well-fitting corset of ordinary fashion, but with long and firm "bones," and made to come well over and grasp the ilia, is sufficient. In earlier days some very slight cases I even put into plaster of Paris; but I soon learnt the worse than uselessness of over-supports, only now using enough to supplement, not supplant, the patient's own efforts at keeping erect.

As soon as the general health permits and that rest has made the patient feel knit together, regular calisthenics must be begun. Sayre's method is the most effectual; and besides that, it can be employed without any disarrangement

of the clothes or elaborate preparation, when once the pulleys have been fixed.

That the exercise should be—as this is—in the patient's own hands, and be able to be carried out without any appearance of rudeness or roughness, which regrettable characteristics are not wanting in some forms of professional drill, is a great desideratum. Less perfect than Sayre's method of exercise is the knotted rope and trapeze and door drill, each of use in mild cases or as supplementary to the swing. All are described under Class 2 ; here it need only be stated that the swing whilst being the most effective is also the severest ; it may be necessary sometimes, therefore, to lead up to it through minor channels.

All forms of suspension-exercise give the advantage of daily *extension* in addition to the rhythmic action of the muscles. The " door drill "—as with other drills employed by different surgeons—whilst it ensures good training for the muscles, fails in the all-important point of extension.

Among amusements of athletic type, that I order where the patient can bear it and avail herself of it, is straightforward swimming, the movement being symmetrical and telling equally on both sides of the spine.

The *after-treatment* in this, as in the next class of cases, though presenting nothing special, is yet the great safeguard against relapse ; and relapse is far from uncommon. The patients are constitutionally weak, and though after a few months' treatment they may appear well, yet quickly on returning to their ordinary mode of life, they tend to develop the lassitude and want of staying power which was at the origin of the primary trouble. In a word, when passed as cured, yet remedies cannot be abandoned. The exercise, whether by swing or otherwise, should be continued once a day, not as a treatment so much as a healthy amusement comparable to dumb-bells. Prolonged over-exertion must be still avoided, and taking the edge off weariness by the supine position for half an hour, instead of lounging in a chair, must be long continued. So often I have seen that the mode of life of the patient, either at home or at school, has been instrumental in bringing about the disease, yet, unless the surgeon interfere, no sooner does he give his patient a clean bill of

health, than back she goes to former habits. It may therefore be necessary in some instances to completely revolutionize all preconceived notions of "bringing up," and here the personal interest and judicious sympathy of the medical attendant may be of more value than the mere prescribing of technicalities. How long all this after-care must be kept up clearly has to be decided in each case, but a couple of years is by no means an excessive time.

Class 2.—*Treatment and after-treatment.*—In this class mechanical treatment is of especial value—attention to the general health, according to circumstances, being duly given. These cases are chronic ; they show therefore, as a rule, less of the symptoms of lassitude and muscular weariness than in cases of Class 1, where the onset of scoliosis is seen to be the direct outcome of these conditions. At once, therefore, active special treatment can be commenced, and prolonged resting in the recumbent position is not of so marked benefit as when the disease is in an earlier stage. According to the surgeon's judgment in each individual case will he graft on the mechanical treatment as much of the before-detailed general treatment as he thinks fit.

Of mechanical methods there are two kinds, one active the other purely passive, viz. calisthenic exercise and supports. Each will be enumerated with the necessary directions for employment.

I. *Calisthenics.*

a. *Door drill.*—The patient stands, her heels together, with her back against the door or wall. She now extends the trunk by muscular effort as much as possible, keeping the back of the head against the door, and as it were, creeps up the door by help of head and shoulders. Having gained the highest position possible (the feet being still kept flat on the ground), the arms, which hitherto have hung by the sides, are now raised, fully extended, in the plane of the body, slowly upwards till the hands meet high over the head ; now by a reverse movement they are slowly brought to the sides again, and by relaxing the muscles of the trunk the patient sinks once more into a position of rest. From first

to last this takes thirty to forty seconds. After a short rest it is repeated, and so on during the space of five to ten minutes.

To hold some light weight in each hand seems sometimes to be a help in steadying the movements of the arms.

B. *Rope exercise.*—This comes in value between the trapeze (in which the patient exercises from a horizontal bar) and the swing. It has the advantage over the former to my mind because it enables more strain to be thrown upon one side than the other, without having to hang by one hand only, as is the case with the horizontal bar when it is desired to obtain the same result. A thick, soft rope, knotted at intervals of ten inches, is suspended in some convenient place; the patient then climbs slowly up it hand over hand, and reaching as high each time as possible over the head till the feet are just off the ground. At this moment that hand should be higher which is on the opposite side to the dorsal rotation or outgrowing shoulder. After remaining suspended a few seconds the patient comes down, and then the exercise is repeated over a period of five to ten minutes.

This exercise is less perfect than the following one, since the pull on the spine is but the resultant of two forces represented by lines in the directions of the two arms prolonged to meet at the spine; hence too the cervico-dorsal part of the spine is not extended at all; the extension is upon the lower half of the spinal column.

C. *Sayre's swing* (*or tripod*).—This is to my mind a perfect exercise for scoliosis, since muscular exercise is obtained together with complete extension of the trunk, both indirectly through the arms and directly through the head. It can be done without any preparation of the dress, and may be left to the patient herself to carry out entirely. The requisite apparatus,[1] as has already been mentioned, consists of a set of movable blocks with a cord attached; to the blocks hang a crossbar and headband, which support the head; when the cord is pulled the pulleys carrying the headband are drawn up. Obviously, if the cord is pulled by a second

[1] See Sayre's Monograph already referred to.

person, the patient may be really hanged ; but if used in the proper way no harm can result.

The patient placed under the pulleys fits the headband on, and facing the cord that hangs down takes it in both hands. The hands are now extended as far as possible over the head, on the cord, and traction made. When the lower hand reaches the level of the mouth it is unclasped and deliberately placed high above the other on the rope, this latter being similarly changed on reaching the level of the mouth. Thus the action is that of climbing the rope hand over hand, and in so doing the whole body is raised from the ground. When the feet swing free, the hand on the side opposite to the projecting scapula, or on the same side as the dorsal concavity, should be the higher. After remaining suspended a few seconds the patient descends, and shortly repeats the process. The whole exercise continues five to ten minutes, but to be able to continue so long the patient must be educated to it, and this will take fourteen to twenty-one days.

At first the pull of the headband makes the neck ache ; but this is quite temporary, and I have not yet seen a case that was unable after a time to exercise in the swing perfectly. It is well worth the trouble of learning, for I know of no exercise for scoliosis that more perfectly fulfils all requirements, viz. regular muscular exercise and extension of the deformity.

Whilst I prefer to employ it in cases of all three classes, yet in mild ones of Class 1, the rope exercise is really enough ; the door exercise, as rule, I keep as a subsidiary and additional drill.

In Classes 1 and 2, whichever exercise is selected, it should be done immediately *after* breakfast and before lying down at night ; the supine position is to be immediately afterwards assumed for at least twenty minutes. In strong patients the door drill makes a good midday exercise.

In Class 3, where no real improvement can be effected, yet these exercises are valued by the patients, as they are conscious of the relief to oppressed breathing and hampered heart movements that the periodical opening up of the

chest affords, and these cases may take their feelings as a guide to when the exercise shall be performed.

II. *Supports.*

As with the introduction of any new remedy, so with the plaster-of-Paris jacket; it was to be the universal panacea for "all sorts and conditions" of backs; and all and every kind of case was thrust into it, with the not astonishing result that, failing to work miracles, its intrinsic and slight drawbacks were made a *casus belli* against it, and it ceased to be employed where there could have been no doubt of its efficacy.

But if the aim of treatment in scoliosis is the permanent restoration of muscle power, why use any support at all? The more the patient is supported, the less the work the dorsal muscles have to do and the more likely they are to waste, and certainly the less effort will the patient herself make to use her muscles properly. This question is often asked in connection with supports in lateral curvature; but an unbiassed review of different degrees of scoliosis, enlightened by clinical experience, soon demonstrates that support in some form or other in the greater number of cases is both necessary and beneficial. It helps to keep in better position the distorted spine, whilst it assists without taking the place of the weakened dorsal muscles; it is only when too rigid and too supporting that it becomes harmful.

1. *Ordinary stays.*—These are wanted for all very slight cases, and in after-treatment to wean a patient from a more rigid support, if such has been used. Any form that is long enough to reach well to the pelvis and is well stiffened with steels and does not aim at producing a wasp-like waist will do, though I have in my own practice a special form which I prefer.

2. *Felt jacket.*—This is a corset made of stiffened felt; usually Cocking's poroplastic felt is employed. To suitable measurements the jacket is made stiff all over except spots corresponding to the breasts and iliac spines; there the felt is still soft. It is rendered pliable by steaming in an oven

and then rapidly applied round the body over a thick merino vest, being moulded on with the hands and kept *in situ* by a flannel roller. It sets in a few minutes and then is removed and finished with eyelet-holed hooks, or in whatever way is thought best for subsequently being laced on. The position of the patient during the process is that described below under the plaster jacket.

The felt jacket is worn in the daytime only, and on being laced on in the morning the patient must for the moment be suspended, as in the daily exercise, in her swing, or lying flat on the ground, but the nearer the position each morning is to that when it was first applied the more comfortably it will fit. A thin or thick merino vest, without buttons, only intervenes between it and the skin.

Where the deformity is severe and the strain proportionately great, a steel slip can be fastened on in the axillary line, one on each side, without materially adding to the weight. The same jacket will last nine to twelve months, but in that time may require remoulding once or twice; and especially if any alteration for the better in the figure occurs this must be done to follow up the improvement.

The plaster jacket.—The application of the plaster-of-Paris jacket has been so often described that it is not necessary to do so here, the more so as I do not find it of the same value in scoliosis as in caries. If, however, felt cannot be obtained then the plaster jacket can be applied, but is best cut up afterwards, and laced on.

The plaster jacket must be put on by the surgeon himself, for it fits to every possible irregularity with great exactitude, far more so than the felt; for the latter is put on in one piece, the former by a succession of bandages, and in its application attention must be given lest respiration be subsequently interfered with from over-tightness, the bandages shrinking as they dry. To apply a plaster bandage to a broken leg is work a surgeon would hardly hand over to the instrument maker; much more then such a complicated and difficult piece of bandaging as is required in these cases should he keep in his own hands.

Even if this form of support is chosen the musculature of the trunk can be kept in perfect order by the use of the

swing; but unless this form of exercise is employed the plaster certainly is not suitable.

In the application of either the felt or plaster certain conditions must be fulfilled. They are: the patient must be in the most extended position possible, consistent with comfort, the chest must be held in the position of deepest inspiration, and the spine relieved from the superincumbent weight of the head and shoulders. No horizontal position can fulfil all these conditions, but the Sayre's swing does so perfectly.

Actually, the best position is when the patient is supporting herself, as when exercising, but since she cannot do this for a sufficiently long time, two armlets are added to the apparatus, hanging from the crossbar that carries the headband; the patient's arms are placed in these, and thus her weight is passively supported by the head and arms, the cord being pulled and held by a second person. The maximum extension possible is not in this manner quite obtained, but it is ample in practice, and the difference is only perceptible on a very critical examination and comparison.

The same plaster jacket, if cut up, can be worn the same time (or nearly so) as the felt; if not cut up then eight or ten weeks are the limit, but in either case if improvement occur a new jacket must at once be applied.

In the *after-treatment* of Class 2 the surgeon must be guided by the state of health of the patient and the degree of success that his treatment has met with. The severer cases of this class cannot be cured in the sense of returning to the normal standard, and so, when he finds the case at a standstill for, say, four months, and all improvements cease, he may consider after-treatment to commence. The less severe the case the longer will the actual treatment be continued in the hope of further improvement.

What has been said under Class 1 as to after-treatment applies equally here. And whilst the general health should be as carefully attended to and an exercise, as a daily duty, continued, more support must often be given than in cases where practically a cure results. In this, as stated, ordinary stays suffice, but in the severer cases of Class 2 the felt, if

it can be afforded, is required for long afterwards, and when stays are eventually allowed they may require "building up" with a view to giving extra support and perhaps masking some deformity, a matter in which the patient is naturally keener than the surgeon.

Class 3. *Treatment.*—The exercises spoken of previously are all useful to expand the chest and help fill the lungs, which is the great trouble in these patients, the development of the muscles being, where the deformity is very severe, not the primary question, since artificial support is always necessary.

In addition to those already described there is one other support that may be mentioned in this connection, and only here do I find it of use : it is the now nearly obsolete "spinal support" of leather and steel. It is constructed on a quite erroneous principle, yet as an almost everlasting (in point of wear) all-round support it may be employed in those cases of crippling by lateral curvature, such as this class represents, where the recurrent expense of moulded supports cannot be borne.

These extreme cases are undoubtedly benefited by the temporary application of the plaster jacket in its original form, *i. e.* not cut and laced ; in fact, by being treated as though they were cases of caries. The maintenance of the spine in a more erect position and the opening up of the collapsed chest, and the ability with which the patients now get about, are potent agents in repairing the general health ; and then, after a time, they are much better able to get about with a "spinal support." Where it is not a matter of expense, felt, strongly stiffened with steels, makes a very comfortable and useful article of dress ; for as such these patients must regard their apparatus, of whatever pattern.

Statistical Results.

Of many cases of scoliosis of all classes that have come under my notice between the years 1877—1886, a large proportion was merely seen once in consultation. Comparatively few have carried the treatment through, under my

own eye; but there are yet enough of these to furnish on analysis an illustration of the value of Sayre's treatment as well as of its modifications, according to the requirements of individual cases.

Of thirty-three consecutive cases of Class 1, twenty-six, or just on 80 per cent., were cured; one, neglecting after-treatment, badly relapsed and then passed from notice; six began to improve under treatment and were then lost sight of, though for that very reason I believe the results must have been satisfactory; they are, however, of course not included in the twenty-six cured.

Of the twenty-six cured, nineteen were under treatment twelve months or under, four between one and two years, and three for over two years, so that a year's active treatment is seen to suffice in most cases; the after-treatment—or, better, the after-care—entirely a home matter, as a guard against relapse, extended a varying time according to constitutional powers, social surroundings, &c.

Of the total of thirty-three submitted to treatment in Class 1, the lines of treatment adopted may be thus classified. Sayre's plaster jacket and swing exercise in five; the swing exercise only, with or without only stays as a support, in twelve; the swing exercise, with felt jacket, in one; door drill in two; trapeze in two; rope exercise, with felt jacket, in one. General treatment only (such as is mentioned under the mild cases of Class 1) in ten cases.

It is more difficult to express in figures the particulars of Class 2, since the length of time that the case is under active treatment will not depend upon the disappearance of all objective symptoms, but rather upon the judgment of the surgeon in respect of the degree of relief he thinks he can afford. My own rule has been when a case came to a standstill over a period of not less than three months, to consider that no further benefit from the treatment was likely to follow.

It must, however, be borne in mind that the danger of relapse is far greater in this class of patients, and that the after-treatment is proportionately an important and more enduring affair.

Of twelve consecutive cases of this class, two were seen

over only a period of five months, and though improving all the time, must be dismissed without further conclusions being drawn from them. Of the remaining ten, six were permanently relieved after active treatment over a period of nine to twenty-four months, and four, though improving at first, relapsed quickly through neglecting to follow out the treatment prescribed. In two of these four the treatment and accompanying improvement lasted only three months, in one eighteen months, in one twenty months.

Of the modes of treatment adopted, in ten full Sayrism, with exercise and plaster jacket, was followed out; in one I began with the exercise and a felt jacket; but relapsing severely after twenty months I resorted to the plaster of Paris, and in one, which eventually relapsed from the treatment not being followed out, the felt jacket and Sayre's swing were employed. There was no reason to believe in this case that the use of the felt prejudiced the case; the patient simply did not trouble to carry out instructions, and the result would have been the same with plaster as with felt.

Cases of Class 3 are not unfrequent, and even in quite young people an extreme degree of deformity from rickets is seen, so that the age of patient and duration of disease afford no criterion on which to give an opinion. Usually these cases get general advice given them, and then are no longer seen; but I have notes of three, hopeless enough in regard to cure, or even substantial improvement from the very first of being seen, who yet were able to be benefited to the extent of personal comfort and ability to shake off much of invalid ways. In one the deformity was extreme, and so interfered with the thoracic and abdominal viscera that dyspnœa and dyspepsia, besides extreme lassitude, rendered the patient's condition very miserable. A series of plaster jackets, together with the daily use of the swing, relieved all these symptoms entirely, though the deformity, to the eye, was not obviously diminished. This case happened in 1877—1878 before the days of poroplastic felt, so when after some time the plaster jackets were discontinued an ordinary "spinal support" was resumed, the patient having been in the habit of wearing one before the plaster was commenced. Of the

other two cases, one at the age of thirteen was quite crippled, the disease being of rachitic type, and having commenced when she was four years old. She was under observation for three and a half years (1878—1882), wearing plaster jackets and carrying out the other details of Sayrism. The note made when last seen was to the effect that the deformity was as at first, but the patient carried herself well, was quite comfortable, lost all pain and lassitude, walked about well and was in good health, wearing only ordinary stays.

In the third case the disease had commenced at seven, the patient being, when seen in 1878, seventeen years old ; she had been all the time under orthopædic treatment with spinal supports. When I first saw her the deformity was extreme and the lassitude bad, with much intercostal neuralgia. Full Sayrism was carried out for two years, and then for two years longer poroplastic felt was employed, with just the same result as in the previous case, viz. general improvement, though none worth mentioning of the deformity.

A FAMILY HISTORY OF DIGITAL DEFORMITIES.

By W. S. MONTGOMERY-SMITH.

(Communicated by C. H. GOLDING-BIRD.)

The following notes, drawn up with great care and after some difficulty in obtaining the necessary information, by my dresser Mr. W. S. Montgomery-Smith, form a contrast as well as a supplement to the "Family Tree" published by Mr. Lucas in vol. xxv of these 'Reports' (1880—1881). In the present case the hereditary deformity took, with the sole exception of the juvenile patient himself, invariably the form of deficiency, and as far as could be determined there was no deficiency in the teeth.

Family history, re deformity, in the case of John Thomas R—, æt. 2 months, from whom a supernumerary left thumb was removed in Guy's Hospital on March 19th, 1888.

Mother (married at 15). Normal. Her family have no malformations.

Paternal grandfather.—Normal. No malformations in his family.

Paternal grandmother.—The first of the family to be malformed. Her mother had a fright whilst "carrying" her. She has no thumbs, her fingers are webbed, her toes

deficient in number. [She is said to suffer but little inconvenience from the want of thumbs. She cannot sew, but is (according to her daughter) an excellent washerwoman.]

Father.—Has one thumb smaller than normal. His fingers are abnormally small, his toes are deficient, being four in number on each foot, a big toe, a rudimentary third toe, and the fourth and fifth webbed.

Paternal uncles and aunts were six in number, three of either sex.

Of the uncles.—*Two* have toes similar to those of their brother (the father). They are both unmarried. The *third* is normal in every respect. He is married and has five children all without deformity.

Of the aunts.—*One* has deformed feet like the father. She has two children, of whom one is deficient in fingers and toes; the other has webbed feet. The *second* has deformed feet like the father. [In the big toe of her right foot the last phalanx is almost at right angles to the first, being deflected inwards.] She has had ten children (five are alive), of whom five have been normal, four have had webbed toes, and the remaining one webbed toes and abnormal fingers. A *third aunt* died, æt. 17, unmarried. She was normal.

The usual deformity throughout the family is that of a foot with four toes, viz. a big toe, a rudimentary third toe, and the fourth and fifth toes webbed. The second toe is wanting.

The patient is the first of the family that has had more fingers than normal, the tendency previously having been to deficiency rather than to excess.

There is no history of harelip, or of abnormality in the growth of the teeth, or of deformity of any part whatever, other than of the hands and feet. An opportunity was afforded of carefully examining the second aunt of the patient, and her teeth were normal.

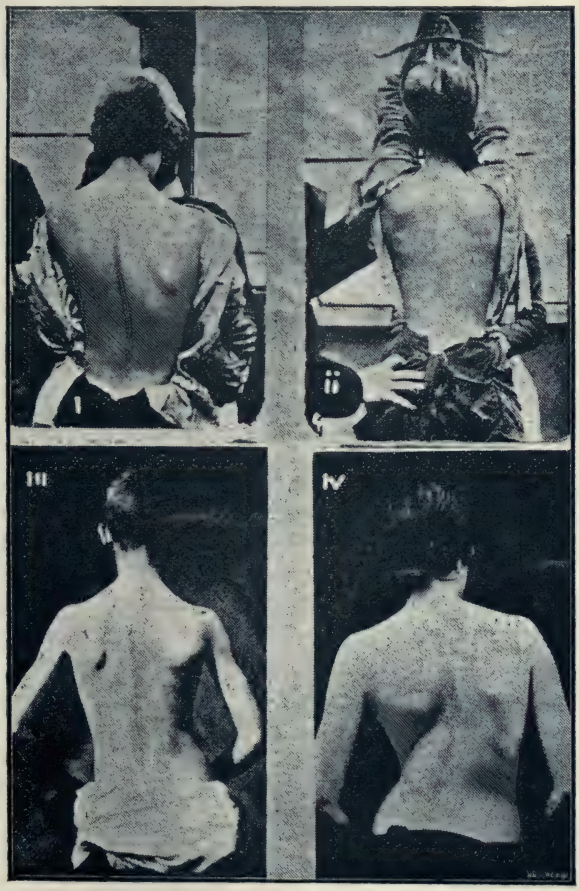
DESCRIPTION OF PLATE.

No. I. An extreme case of Class 1 bordering upon Class 2.

No. II. Showing the effect of the swing in obliterating the deformity; the left arm is the higher.

No. III. A good average case of Class 1.

No. IV. A typical case of Class 4.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SOME GENERAL POINTS

IN THE

RATIONAL AFTER-TREATMENT OF SURGICAL CASES.

By C. H. GOLDING-BIRD.

The after-treatment of surgical cases is as wide a subject as surgery itself, and includes the dressing of wounds and all other matters concerning the well-being of the patient. With the treatment of the wound I am not now concerned, but restrict my remarks to what may be called the medical side of surgical after-treatment, which a surgeon, however "pure" or "special" he may consider himself, must be acquainted with, unless he is to be regarded as a mere operating machine; a style, I trust, now of the past.

After-treatment does not necessarily presuppose ultimate cure. How many surgical cases, failing to be relieved by operative measures, may, though handicapped in the battle of life, be assisted by skilled after-treatment, to an extent that at first appears impossible, and become useful members of society again. Yet no phase of after-treatment is more laborious, or requires more patience on both sides, or demands more intelligent skill on the part of the surgeon, than that which has to be devoted to the great class of surgical invalids or incurables. Keen to detect the slightest oversight of one genuine pain, they yet have to be helped to steer clear of that rock on which so many founder for life, viz. over-attention to and over-estimation of lesser though

often recurring intercurrent symptoms of no real moment. And perhaps, in this chronic after-treatment of incurables, there is one fault which stands out before all others far too often, viz. assistance is sought in special foods; in drugs; in apparatus, which might have been dispensed with (if even ever required) had a scientific view been taken, not of the patient as *patient* only, but of his relationship to his surroundings; and a determination been cultivated in him to regard his altered state as a "condition of life," and not a disease to be perpetually treated.

It is a false charity to forbear telling such a patient that he may no longer hope for cure. Hope with reason is good; but there is a time when hope is folly; and by not telling the patient at once to face the inevitable, permanent moral injury will be done sooner or later.

Take an example: one sees at times a case of spinal caries, long since well—as well as he ever will be—but still hoping for cure, and wearing some appliance, or obeying some rule of life, which answered when disease was active, but is now only tending to hold back the patient from healthy occupation of both body and mind, and has the injurious moral effect of perpetually reminding him of his disability. Surely it is kindest and wisest to tell such a patient to put aside his artificial aids, and with them the false hopes he attaches to them—which when allowed too far have a truly demoralising and incurable effect—and to face at once the "struggle for existence." Why are all surgical incurables or invalids so alike? Why are there certain chronic cases which we can all classify as belonging to one species—that of the invalid—whilst the diseases that handicap them are legion in their variety? Is it not because an under-current of the same moral temperament runs through them all—influenced perhaps by hereditary tendency, but in the main acquired. They lack education and practice in self-help; and *we* are too often to blame for not having set the task and seen that those around enforced its fulfilment.

Lately I have had occasion to look over my notes of cases of lateral spinal curvature. I have had a certain measure of success in treatment, but this I find has been rather due to throwing the work of cure upon the patient herself, than by letting her imagine that she was a passive item in the process.

I know of no cure for this disease of which the major part is not the patient's own effort, urged on by an appreciation of her condition and of her future prospects. Even then, however, many have to be *after-treated.* But once let the Rubicon of hopeful *curative* treatment be passed, and then instead of consigning the case to the limbo of incurables, it may, by scientific treatment—physical and moral—be made to face its new condition of life, and again take its place in the world with more or less activity.

In chronic after-treatment, like this, no rule can be laid down definitely; each case must be studied by itself; but one thing is certain, that the surgeon's responsibility is enormous: not the patient's idiosyncrasies only, but his doctors too, have to determine the future of a life.

One can speak more definitely of the after-treatment of acute surgical cases, and less personal responsibility remains to the surgeon if he obeys certain rules which are the outcome of our increased knowledge in late years of the normal processes of the body. I have selected some points to study which are familiar to all, and will endeavour as far as possible to appraise their therapeutic value by a physiological standard.

An operation we will suppose has been performed under chloroform; the return to consciousness is the first anxiety; the next the possibility of "chloroform sickness." In connection with the former, collapse with cold surface is at times seen delaying recovery, not due necessarily to the gravity of the operation, but to the anæsthetic where it has not been quite properly administered, either too slowly, whereby the patient gets "saturated," or not continuously enough, so that the shock of the operation is physiologically appreciated, though not consciously felt. Here, besides hot packing, of which I shall presently speak, the administration of alcohol by mouth or rectum—or even subcutaneously, though the effect in this case is very evanescent—is advisable, the patient's head being kept low.

Especially in such cases may we expect vomiting, and though I am certain that, as with sea-sickness, idiosyncrasy has much to do with it, yet the smell of the vomit and the patient's taste, confirm the opinion that either the vapour of the anæsthetic is being eliminated by the alimentary mucous membrane, or that

much of it, or even of the fluid, has been swallowed—a by no means uncommon circumstance. Usually, hydrocyanic acid; tincture of iodine; bismuth; coffee; tea, &c., are given to stop the vomiting; one or other succeeds at times, but their use is purely empirical. There is also a rational method; the stomach must be first evacuated, and then solids given. We now both empty that organ of contained vapour or fluid, and give it something to contract regularly upon, and thereby arrest its temporarily acquired habit of vomiting. My standing rule is, if the patient vomits frequently, give half to one pint of warm water, or salt and water; make him sick outright, and then give immediately half a small biscuit or any solid at hand. This method rarely fails.

Next comes the question of pain. Because there is pain, it does not follow that anodynes are to be given; let the cause at least be first sought out—position, support, relief from pressure, should be all tried in suitable cases; and not till then should opiates be given. Much of the pain experienced immediately after operation is due to the condition of general misery to which the patient has been temporarily reduced; the more the depression the more the pain. We too often regard pain as a demon to be exorcised, or erroneously think of it as a known and measurable quantity, whilst in truth it is only to be estimated by the then condition of the individual who is the subject of it, by the alleviation of which condition the ability to bear pain is much improved; and thus we may often, and not unfeelingly, omit the opiate and avoid those complications, as of the bowels, which usually attend its employment.

But where anodynes are necessary none are worth considering by the side of opium, though I have learnt to fear it in cases attended by severe collapse, as, for instance, after nephrectomy, preferring to use alcohol freely, and thus, whilst combating the collapse, stimulate the patient to bear his pain, or even carry its administration to a narcotic degree. I lately did so with marked success in a case of amputation at the hip-joint, attended by profound collapse, in an adult worn out by disease. He had, to his advantage, 12 oz. of brandy every twenty-four hours for three days. Prior to operation, especially with very nervous people, a draught or an enema containing opium can be

given, its effect being continued after that of the anæsthetic has passed off. Opium as a vaso-constrictor of the vessels of the brain, and administered prior to operation, has been lately advocated by Horsley in trephining cases for brain disease; and it is frequently thus employed beforehand in hernia (or other cases where there will be much after-pain, as in rectal operations), when its power of paralysing the musculature of the intestine and of stopping peristalsis is required. In all such cases, too, I prefer opium itself to pure morphia.

For temporary pain, as from the operation-wound (I do not speak of severe chronic pain from some irremediable condition, though I think I might almost include it), the wholesale way in which, especially in hospital practice, morphia injections are resorted to, is to my mind indefensible. Morphia and opium are somewhat different in their results; the former is more agreeable in the comfort it brings, its effect more concentrated, but also more transient; whilst given subcutaneously its action is intensified and most insidious. The patient, spite of the pain of the needle puncture, rapidly develops a craving for it, and his misery when its use is discontinued is pitiable. Morphia injections give a feeling of warmth and of comfort in a peculiarly marked manner, and when their effect has subsided a feeling of cold and of general misery results; a condition inimical to surgical repair. In surgical after-treatment I hardly ever employ the drug thus, and as a standing rule it is forbidden in my hospital practice; and in private a short experience will demonstrate that if the patient becomes the slave of the syringe, the administrator soon becomes the slave of the patient.

Sleeplessness after operation may be from pain or not, and the method of relieving it must be considered in each case. Where pain is not the cause of the insomnia, anodynes should not be used in the place of simple soporifics; in this latter capacity it is that the morphia syringe appears so temptingly suitable, and is so culpably harmful. The very strangeness of the patient's condition and surroundings may totally banish sleep, and frequently the physiological conditions known to accompany—I do not say to cause—sleep are unfulfilled. Anæmia is the cerebral state in sleep; hence we can hardly expect a patient with bloodless and chilled surface (as is constant in peritonitis when untreated, and frequently seen

after operations) moaning, miserable, actively worrying himself, and feeling cold, to go to sleep. The physiological state of that man is that his body cavities are engorged with blood, and rigors frequently bear witness to this, and the best chances here of inducing sleep are to determine blood to the limbs and general surface and relieve the congested brain; and until at least this has been done the use of drugs can be hardly regarded as scientific. But I have said such a case feels cold; the thermometer does not, perhaps, show a reading below normal, but the obvious absence of blood from his skin (or its stagnation, as shown by bluish congestion, in parts) has deprived him of a sense of warmth; and this negative state is now positive pain, quite as much, or far more, than cold aching feet, which are a familiar cause of insomnia. Hot pack such a case with blankets till he sweats, and aid the cutaneous vascular dilatation by alcohol or by Dover's powder, and then the moment the skin moistens the feeling of restless misery departs; his aching skin—for aches are not the sole property of teeth and bones—once more seems to belong to him, and with contentment on his face he falls asleep. Markedly was this so in a case of would-be suicide I was called to a few months back, where, superadded to his melancholic depression, was one from great loss of blood. I found him (though he had been attended to by a well-known and able practitioner, and who had treated the wound most skilfully) lying half covered over in bed and as cold as ice; and I was immediately asked to sanction opium in order to obtain sleep. My answer was to take the bull by the horns; to assist in arranging his bed, putting him in a comfortable position, to give a little brandy and beef-tea, and smother him with hot blankets. Before an hour had elapsed he was warm and inclined to speak; expressed himself as quite comfortable, and though, as I learnt after, he did not actually sleep, he was comfortably drowsy all night, and no soporific drug was given from first to last. The bowels acted the next morning, and all went well in the future.

Another form of sleeplessness claims attention. The patient sleeps the early part of the night, but wakes in the small morning hours to tossing restlessness; and though he may sleep again towards morning the feeling of unrest remains,

acting prejudicially upon the surgical aspect of the case. This is especially seen in exhausted and in aged patients; and there are two good reasons for it. The first is an empty stomach. A hungry man cannot sleep; and after operation (taking into account the pre-chloroform starvation period) a patient is physiologically very hungry, though he may not be conscious of the feeling. It may not be wise to give much food; yet, like cold feet or a cold skin, an anæmic gastric mucous membrane is a cause of insomnia. I am sure it is often forgotten how long a patient has fasted after an operation, taking into consideration, as I have said, the hours he took to "train" for the anæsthetic.

In such cases a very little solid indeed suffices to alter all this. Half a biscuit will determine blood to the stomach and produce a local feeling of comfort, just enough to turn the balance, in the early morning, once more in favour of sleep, for the tendency of the hour is towards sleep. An overworked brain will find this a better prescription than opium and chloral, and the more he can worry his mucous membrane the more likely he is to sleep. Hence I prefer oatmeal to ordinary biscuits; and it will be remembered that in his masterly work on therapeutics, Lauder Brunton remarks of the soporific effects of lettuce, that they are due probably less to the lactucin than to the indigestible cellulose the man puts into his stomach at supper time. When therefore I hear of this "morning restlessness," I insist on food being given and not drugs; and to convalescents I allow suitable food at the bedside to which they can help themselves. But the action of the food is not of course solely mechanical, though in the young and fairly strong this may suffice. But in the old, food, as fuel, is wanted; and if not given *per os*, it must be *per anum*. In the small morning hours a man is, physiologically speaking, least a man; they are the worst in the diurnal cycle, and should be the most dreaded for the aged or exhausted; hence, too, why as morning breaks so many cease to exist. Besides food at these times, the renewal of hot bottles or blankets must be seen to, for temperature and pulse are now alike both low, and thus sleep again is procured, and in not a few instances life may be saved.

Where a soporific drug is requisite I much prefer chloral; it breaks a habit of restlessness, and one good night's rest often

is enough for this. Its continued use I need not add is reprehensible. Bromide of potassium I rarely order; it depresses the patient and upsets the bowels.

The influence that the belief that a soporific is being given has upon an insomnic patient cannot be over-estimated, and though, after all, a deception on the part of the surgeon, it is a legitimate as well as a therapeutic one. The nightly injection of pure water in morphia syringe is of unquestionable value; so also the good old "pil. panis." I unintentionally improved on this pill in the case of a very restless and tiresome gentleman, who had been accustomed to dose himself with bromide of potassium and other sedatives. He was well educated, and carefully criticised his prescriptions; so to guard against discovery I wrote the following:

℞ Torul. Cerevis.,
Amyli,
Sod. chlorid.,
Gluten,
Aq., āā, q. s.
Make a pill, to be taken every night.

The result was perfect, and even its value enhanced by the fact that the puzzled dispenser returned it the first time as not quite comprehensible. It was thereupon duly criticised, with further addition to its value, as will be seen by the remark made me by the patient's wife: "I knew it was a good pill; I could read 'amyl,' and nitrite of amyl is so good for the nerves!"

I have referred to *rectal feeding*. It is most valuable in after-treatment. The colon, by virtue of its contained bacterial ferments, can digest in a fashion, but it is far better to give the meal already peptonised, or at least mix the ferment with it when administered. My formula is always beef-tea, ℥j; yolk of one egg; liq. panc., ʒj (Benger); wine, ℥ss; warm milk, to ℥iij; with a "pinch" of bicarbonate of soda.

Drugs are added if required, or the wine is omitted. It is best to let the enema, minus the wine, digest in the warm for half an hour before. It should not exceed three fluid ounces, and must be given with a three-ounce ball syringe, fitted with four-inch gum elastic nozzle, and be injected at one squeeze, without any admixture of air, the patient's buttocks being slightly raised. Firm pressure must be maintained on the anus for a minute after the withdrawal of the syringe. In this way I have had

patients fed every four hours for days together, without the slightest rectal irritation. Larger injections, or injections thrown in with a syringe holding more than the amount desired to be administered, irritate, and soon cause the rectum to become intolerant of them.

No patient need starve if under skilled observation: the surgeon has now many ways of "getting inside." Last year I did a gastrostomy—a forlorn hope—where enemata had been employed before I saw the case, *ad nauseam,* or rather, *ad defæcationem.* As there was no time to be lost I fed the patient on the operating table, by perforating the anterior wall of the stomach that I had sewn to the parietes through a large hollow aspirator needle. The benefit, though temporary, was, however, very marked.

It cannot be too often remembered that the giving of food is not merely for building up tissue—this is a minor consideration in the present connection—but rather that it is the supplying of force on which vitality is maintained; and where the patient is too exhausted to convert the force of his food into vital energy, we must aid him with heat from outside, and also by diffusible stimulants, which as drugs, temporarily revive—in quite an empirical manner—his all but dormant energies.

Were the question asked, Through which natural channel can we most influence a man after a severe operation? I should answer, his *skin.* We want the skin as an accommodating circulatory area of immense extent,—someone has said thirty miles of superficial blood-vessels! We want it also as a recipient of heat, and as a part of a complicated reflex machine to receive impressions, mainly of heat and cold, whereby we may obtain ulterior effects.

I have mentioned already the condition of collapse expressed in a cold, bloodless skin and passively congested viscera, and the peculiar nerve manifestations and feeble heart's action are due in great measure to the reflex effect of the cold skin (cold because bloodless) upon the great nerve centres. We all recognise the quickly collapsed state produced by too long immersion in cold water; the delicate nerve endings are profoundly influenced, and then, reflexly, breathing and heart's action are lowered. The opposite state obtains where hot applications are made, notably where hot fomentations are

applied to the scrobiculus cordis. Whether we stop the cutaneous circulation by exposure or by causes from within, the result is the same, and peritonitis will furnish us with a good instance of the latter class. In regard to collapse from exposure it must be remembered that exposure of only a part of the body to cold may effect this, as circulating iced water through tubes in the armpits will lower a general fever temperature.

Bearing all this in mind, we have at once indications for rational treatment of a condition that obtains after all grave operations, at least for a time, and in abdominal ones is the great and often fatal hindrance to recovery throughout, and it is as simple as effectual. Hot pack such a case with blankets and bottles to the chin; do not allow even a hand out, and keep him if necessary thus for days, and when once the cutaneous circulation is restored comfort is given, and if vomiting happens to have been a symptom (as is likely in the abdominal congestion of peritonitis) it will usually cease at once. In chloroform vomiting it is a valuable aid, for if the skin is cold the method suggested already for treating this condition may fail.

Sudorific drugs can be added, though I never do so. If determined on they must be of a class to dilate the cutaneous vessels, *e. g.* Dover's powder, and not one merely acting on the sweat-glands, directly through the nerves, as pilocarpine. Surgically we do not want the sweating, but it comes as a sequence to the increased vascularity. I have no experience of nitrite of amyl in general collapse; in some respects, however, it appears on theoretical grounds to be indicated; practically I think its disadvantages greater than its advantages.

In practice, for testing the surgeon's skill in after-treatment, nothing can compare with abdominal cases (as the various 'sections,' ovariotomy, hernia, and the like) with all their peritoneal possibilities. His treatment can be prophylactic from the first if he has at the operation excluded the usual causes of inflammation; or if peritonitis has commenced the same treatment is curative, and in most instances successful.

In peritonitis two great pathological changes are seen, and from the point of view of after-treatment must be remembered. (1) Increased cell-proliferation from the surface of the serous membrane, usually insignificant and disappearing; at times

permanent, as *adhesions,* or fatal—or nearly always so—as *pus.* That such changes should rapidly be induced is not strange if we remember that serous sacs are only dilated lymph channels, and the rapid facility with which lymphatic structures inflame and alter, *e. g.* glands, tonsils, is familiar to all. The influence of this cell change on the patient in acute cases of peritonitis is most probably through its effect on the endings of abdominal nerves, but since the second pathological state I have to mention far surpasses in this respect the actual inflammatory cell changes, I will confine my attention to it alone; besides the mode of dealing with peritoneal adhesions or pus is a subject by itself, and hardly one of after-treatment.

This second pathological state in peritonitis is extreme injection of the peritoneum by dilatation or relaxation of all the blood-vessels of the portal system or area, with subsidiary conditions of paralysis of the musculature of the intestine producing constipation and tympanites.

A peritonitis case does not die from height of fever. In acute as well as subacute cases the temperature often is subnormal, hardly ever really high; it is no guide as to the patient's state. The case dies, when untreated, with cold and blue extremities and a passively suffused face, but the general surface is anæmic, and the patient vomits incessantly to the last. He "goes out" like the snuff of a candle, and this state is not because he is dying. He dies because of it. He vomits not because he is constipated, but from the reflex nerve irritation arising in his engorged peritoneum, and all the above-mentioned objective appearances point to his visceral cavities, especially the abdominal, being congested. We may here remember that it is known that the whole of the blood in the body can be accommodated in the portal system when (experimentally) completely relaxed. Death therefore is much like that from exposure, as I have already remarked; it is at times much like that from internal hæmorrhage, doubtless because of the sudden lowering of the systemic blood pressure from distension of the portal vessels. A case of sudden escape of alimentary contents into the peritoneum exactly resembles internal hæmorrhage, and in watching, say, a case of abdominal section it is hard to say sometimes if the symptoms mean hæmorrhage or sudden oncoming peritonitis. The pulse

becomes very rapid, small, weak, but presently wiry or contracted. The patient sighs and gasps for breath, cries out that he is suffocating, struggles often violently, and craves for drink. He is really *bleeding to death into his portal area.* He is performing what to physiologists is known as the "portal paradox." Where the onset is more gradual the one unfailing guide, more reliable than pain, or distension, or constipation is the gradually rising and hardening pulse, and where, after the first effects of the operation have subsided the pulse begins to fall, there is not much to fear.

In *abdominal operations,* if rational after-treatment is begun at once it is prophylactic, and as a "cure" it may never be required. The most popular remedy, but to my mind the most injurious thing that can be given, is *ice.* Here is a case dying with low temperature and collapse in whom heat must be preserved, and perhaps to whom it must be given, for the coldness of the limbs does not point to much chemico-vital activity in the skeletal muscles which are the great thermogenetic tissues, and yet water at 32° F. is unsparingly supplied. Of course it allays thirst, and even lessens the frequency of the vomiting, the stomach now rejecting *en masse* at longer intervals several ounces of thawed ice; peristalsis is provoked, and tympanites increased. Not one physiological requirement is fulfilled; and worse than that, because ice is given, often nothing else is considered necessary, and because it is duly vomited it is argued that the stomach can retain nothing, and starvation is added to the other troubles. Opium I have known withheld simply because if given the pill will be returned, and add to that scant covering with bedclothes, and can it be wondered at that the otherwise favorable case of hernia succumbs?

Not to be wearisome, I will state categorically the lines upon which I work, and which will fulfil the physiological requirements of relieving the congested peritoneum, and hence the reflex symptoms resulting from it, of giving heat, maintaining the body temperature, of allaying peristalsis and vomiting, and giving food into the bargain. No ice or cooled drinks, nor effervescent liquid unless "flat;" nothing by the mouth, or in exceptional cases cold water literally in a teaspoon three to four times an hour, not more. The enema before mentioned, with

opium and port wine, every three to four hours. The wine allays the craving for fluids at once; the opium allays peristalsis and general pain, and assists the skin to act, quieting also the higher nerve centres. Hot packing till sweating occurs, and a pillow under the thighs, but not a hand is to appear above the bedclothes. The moment reaction sets in almost certainly will sleep be obtained. If peritonitis has not appeared then this treatment is preventive, and in all hernia or other peritoneal cases I employ it, in public and in private, only giving a little more food by the mouth instead of by the rectum; but that even is stopped if any untoward symptom appear. Although I have thus illustrated my remarks on after-treatment by special reference to abdominal cases, yet with intelligent variation the same *modus operandi* is applicable to almost all grave operation cases where more or less collapse and shock will be found for a time to prevail.

I might mention one case in hospital practice that I was asked to see with a view to abdominal section for supposed obstruction. It was a young man, who was lying in bed the picture of abdominal misery and distension, vomiting every two minutes; having 2 lbs. of ice at least in twelve hours, and nothing else, as he "was so sick." He was icy cold, and had kicked off his bedclothes. After examination, I gave my opinion that it was a case of ordinary constipation, with extreme tympanites aggravated by treatment. I took the ice saucer from his hand, much to his disgust, and treated him in every particular as I have stated above. It was 4 p.m.; he never vomited after the next hour. In twelve hours he was practically well; within two days his bowels were naturally open. On the third day his physician saw him, and for reasons that I do not know returned to the ice-sucking, and the man "to his vomit," and relapsed into his previous state.

Since adopting rational after-treatment my results have certainly improved; but on looking back to earlier years I see many cases that I now think might have had better chances of success. Take hernia alone. I have notes of seventy-five cases operated on in twelve years; half this number has been done since 1882, and of these the deaths are eight. Two were quite hopeless when seen, and from advanced peritonitis were beyond all chance of life. Six died from complications, as

hæmorrhage, ruptured bowel, &c.; not one from what we may call ordinary post-operative peritonitis. The former half-number of cases show seventeen deaths, extending, it must be added, into pre-antiseptic days. Of these several died of post-operation peritonitis. At that period I merely gave opium, and ice, and followed what was and is still customary.

The use over limited areas of local applications of heat, of cold, of various chemical substances, and internally of so-called *alteratives*, all of great value in after-treatment, I omit all reference to; any attempt to explain their modes of action, or to classify the circumstances under which they should be employed, would lead one too far afield. The special point I have tried to prominently bring forward is, in the language of Evolution, the influence of the environment upon the individual —too often disregarded for the more easy and empirical administration of drugs, whilst rational influences lie ready to hand unnoticed. Though much of surgical after-treatment must be empirical still, in spite of great physiological advances, yet to such an extent have the conditions of life of the body, both as a whole and in part, been unfolded in late years, and the means indicated whereby we may control its various processes, that surgeons can hardly lay claim to being scientific unless they use this knowledge to their patients' welfare, not only by increasing the field in which as operators they may safely work, but by intelligent after-treatment conducting the case to a successful issue; and that not only in the sense of a life merely prolonged, but of one restored as nearly as possible to the normal standard of health, and again rendered, both morally and physically, fit to fight the battle of life.

ON SIMPLE ULCERATIVE COLITIS

AND OTHER

RARE INTESTINAL ULCERS.

By W. HALE WHITE, M.D.

From time to time one meets with patients in whom the colon is found to be severely ulcerated, although it is clear that this is not due either to tuberculosis, typhoid fever, or malignant disease. Cases 1 to 11 appended to this paper are examples of the condition about to be described, which is often known as ulcerative colitis. In an extreme case, the muscular coat is exposed, and the ulceration is so extensive that only islets of mucous membrane are left here and there. Often these are considerably swollen, and consequently they look taller than they otherwise would, and frequently they are more or less sessile because the ulceration undermines them. The result of this is that a careless observer concludes that the islets of mucous membrane are polypoid growths, and the exposed muscular coat is the natural level of the colon. The vessels of the mucous membrane are dilated, and sometimes it is black as though from long-standing congestion. The muscular coat is hypertrophied, and in one case (No. 5) it is mentioned that the ulceration has a tendency to run along the mucous membrane of the longitudinal muscular bands. Any part, or the whole of the colon and rectum may be affected; in one case, No. 5, it was possible to feel the ulceration just inside the anus. Sometimes perforation occurs; thus, in the case just mentioned, the ulceration had made its way into the tissue outside the bowel. In Case 3 the sigmoid flexure was perforated, and fatal peritonitis resulted; and in Case 4 there was perforation of the cæcum. Usually the large intestine is the only part of

the gut that is affected, but that is not always so. Thus, in Case 2 there was catarrhal inflammation of the small intestine. In Case 4 the small intestine was much ulcerated; in Case 9 the whole of the ileum was dark and evidently much inflamed, and the lower six inches were honeycombed by many small ulcers, many of which were very deep; there was the same condition of things in the colon, but it was not so marked. In Case 10 the small and large intestines were ulcerated, from the duodenum to the colon, both inclusive. In Case 11 the lower part of the duodenum was severely affected by ulceration, which had run right round the bowel.

At the time of the autopsy it is often remarked that no sloughs were present, but in Case 3 the floor of an ulcer was sloughing, and perforation resulted. In Case 9, although there was no perforation, the floor of one of the ulcers was a slough, which had set up peritonitis; also some of the other ulcers were described as sloughy, and covered with sloughs.

An examination of the description of one of the autopsies (Case 11) shows that the disease may get well, and I shall later on recount a case in which a patient, who had all the symptoms of this disease, was dismissed from the hospital cured. Of Case 11 it is recorded that there were several pigmented spots of old ulcers, but in most of the cases it is clear there was no attempt at repair; but even then the process may have stopped, although none of the ulcers have healed.

In Case 4 it is stated that there was a small ulcer in the stomach. Most frequently Peyer's patches are not mentioned, so that probably there was nothing noteworthy about them. In Case 9 some of them were diseased. Those which were ulcerated were affected in a very peculiar way; the patch was cut into bands by ulceration extending transversely across at various levels. Many Peyer's patches were swollen, and this is also recorded of Case 4 in which some were slightly ulcerated. Of Case 10 it is distinctly recorded that Peyer's patches were healthy. Once only is it mentioned that the mesenteric glands were enlarged, and never are the vessels stated to be plugged, although once ulcerative endocarditis was present. Never was there any evidence of constriction of the bowel in the cases of ulcerative colitis appended to this paper, nor in any of the museum specimens I have seen.

The origin of this ulceration is extremely obscure.

Firstly, it is not dysenteric. Dysentery is a definite disease, probably specific, with definite symptoms. In none of the cases that I have collected was a diagnosis of dysentery even suggested during life, and often it is stated that the patient had not been abroad. As Wilks and Moxon put the case, it no more follows because there is ulceration of the intestine which in some specimens reminds one of dysentery that the disease from which the patient died is dysentery, than because a condition of larynx quite indistinguishable from diphtheritic ulceration is found that therefore the disease causing the ulceration was diphtheria.

Secondly, we must consider its relation to catarrh. In Case 2 there is mentioned catarrh of the small intestine; in Case 4 the mucous membrane is described as shreddy; in Case 6 it is said to be thick, and covered with yellowish adherent lymph; and the same description would apply to the eighth case, in which it is also noted that the colon was excessively vascular. In the next case the whole of the ileum was very dark and evidently severely inflamed. In Case 10 there was round each ulcer a very red halo of congestion. Therefore, although it is nothing more than might have been suspected, we may, I think, conclude that this form of ulceration is often preceded by congestion of the intestinal mucous membrane.

Thirdly, the solitary follicles have often been thought to play a part in the origin of the process, resulting in the condition of ulceration now under discussion, and which at Guy's we have, following the teaching of Wilks and Moxon, been accustomed to speak of as simple ulcerative colitis. These authors say, "We have seen a case attended by discharge of mucus and blood where after death the whole internal surface of the colon presented a highly vascular, soft, red surface covered with tenacious mucus or adherent lymph, and here and there showing a few points of ulceration; the coats also were much swollen by exudation into the mucous and submucous tissues. In other examples there has been extensive ulceration commencing in the follicles and spreading from them to destroy the tissue around, thus producing a ragged ulcerative surface which is so far identical with the effects of specific fever dysentery that the distinction between

the two conditions rests on the characters of the accompanying constitutional disturbance, just as scarlatina is known from simple cynanche by the addition of its proper fever to the swelling of the tonsils."

This description corresponds very closely with that of the first eleven cases in this paper, which are those now under consideration, save that in them there is no mention made that the ulcers began in the solitary follicles.

Leube, in the article in 'Ziemssen's Cyclopædia,' speaks of simple catarrhal ulcers which may begin with simple lesions of epithelium, or in the more chronic cases with small collections of pus which rupture; the ulcers enlarge, undermine, and coalesce, leaving islets of polypoid mucous membrane. Often, he says, quoting from Rokitansky's 'Pathological Anatomy' the primary irritation is in the solitary follicles. These swell, suppurate, and break down, leaving islets of healthy mucous membrane; this condition is found almost exclusively in the colon. Healing by cicatrization is much rarer than in simple catarrhal inflammation.

Nothnagel ('Beiträge zur Physiologie und Pathologie des Darmes,' 1884, p. 224) gives an account of intestinal ulceration which may follow simple catarrh and spread either from the solitary follicles or other parts of the intestinal mucous membrane. In a footnote he says he has never seen a case in which it was certain that this condition was preceded by submucous collections of pus. I shall presently have to show that this fully accords with our experience at Guy's.

Bertrand and Fontan in their recent work, 'De l'Entéro-colite chronique endémique des Pays Chauds,' describe dysenteric ulcers as sometimes giving the appearance of "ulcères en jeu de patience," which is a very apt description also for ulcerative colitis, for it means that the ulcers are irregular as the pieces of a child's geographical puzzle, but these authors do not say anything about the origin of this condition.

Rokitansky's own account is the same as those just mentioned, and the works of Habershon, Begbie, and Bertin do not yield any further information.

From our post-mortem records at Guy's I have collected six cases, Nos. 12—17, in which, either from the heading of the report or from the description, the case has been called folli-

cular ulceration. Now, it is to be particularly noticed that among the cases No. 1—11, which are those of simple ulcerative colitis, five had no other disease than the ulceration of the intestine, and even with those that had it is extremely probable that the ulcerative colitis was the cause of death; but in the cases which are called follicular there was always some other malady sufficient to cause, or at any rate greatly to accelerate, the patient's death. Thus, Case 12 was that of a small child who had recently had measles, and was admitted for severe eczema; Cases 13 and 14 had tuberculosis; Case 15 had typhoid fever; Case 16 was one of epithelioma of the rectum; Case 17 was one of incarcerated hernia, so that it is quite possible that all these patients if they had lived longer would have presented intestines similar to the others, and would consequently have been called cases of simple ulcerative colitis. So far my cases support those who consider that simple ulcerative colitis may arise from follicular ulceration, for in all the cases which have died early the ulceration is follicular; but if this be the true origin of simple ulcerative colitis it is difficult to understand why no follicular ulceration of the colon is ever mentioned as being present in the severe cases, the nearest approach to this being in Case 9, in which Peyer's patches were affected. One would have thought that whilst at some parts the malady might be seen far advanced, at others it would be seen to be follicular, and conversely, that in those cases which were mainly follicular the ulceration would in some places have passed into the condition of early, simple ulcerative colitis; also if the solitary follicles are always affected it seems strange that swelling of the mesenteric glands is so rarely mentioned.

Of the eleven severe cases five had no other disease, three had granular kidneys, one had gout, and this patient also had a small gastric ulcer, one had endocarditis, and the remaining one, No. 6, had tuberculosis. This last case is perhaps more allied to follicular ulceration than simple ulcerative colitis, and might perhaps be placed among the follicular cases, but I have not done so, for the colitis was very intense although the ulceration was but slight. Cases 13 and 14 are also examples of non-tubercular ulceration, in cases of tuberculosis. They have been placed under the heading of follicular ulcers, because

it is a well-known fact that non-tubercular follicular ulcers, due to little collections of pus, may arise in cases of phthisis. Possibly Case 6 also arose in this way. If we allow that its position is doubtful we have ten cases in which there is no evidence that the ulceration was follicular, and in three of them there was granular kidney, and six cases of follicular ulceration without one of granular kidney. It is further noteworthy that of these six cases three had other intestinal disease, namely—Case 15 had typhoid, Case 16 epithelioma of the rectum, and Case 17 hernia, whilst none of the ten cases of simple ulcerative colitis had any other intestinal disease. It seems to me that these different associations of the two sets of cases go to support the doubt which, for pathological reasons, we have seen might be entertained as to the follicular origin of acute ulcerative colitis.

This doubt is intensified by studying the specimens in the Hunterian Museum, for there are to be seen several excellent specimens of follicular ulceration, viz. Nos. 2464, 2465, 2466, and 2471. The last is a very severe case, and the ulcers caused vomiting and diarrhœa, with death. They are situated in the colon, and are very numerons, about one to three lines in diameter. Their margins are clean cut under their edges so that they are shaped like an inverted cup; they have not run together, and the intervening mucous membrane is healthy. It will be noticed that this is very different from the undermining ulcers exposing the muscular fibre and running together, leaving islets of swollen polypoid mucous membrane, which are so characteristic of simple ulcerative colitis. The fact that none of the specimens of follicular ulceration in the Hunterian Museum, not even this very severe one, show anything characteristic of simple ulcerative colitis, seems to me to throw great doubt upon the hypothesis that simple ulcerative colitis does arise from follicular ulceration.

Clinical history.—Eight of the eleven patients who have been grouped together as suffering from simple ulcerative colitis, were males, three were females; the average age was forty, the youngest was seventeen, the eldest fifty-nine. It clearly, therefore, is not a disease of childhood. The previous history and family history seem to be unimportant. In the most acute case (No. 10) there was only three days history, the

patient was very suddenly seized with abdominal pain and diarrhœa, he died collapsed, and the ulceration was found to be acute, and to affect the duodenum as well as the colon. One might have been tempted to assume that affection of the duodenum necessarily meant a speedy termination, but the other case in which the duodenum was inflamed does not bear this out. It is difficult always to fix the exact date of commencement of the illness; thus Case 5 had always been relaxed in his bowels, but the more severe symptoms only set in ten weeks before death. Apparently the longest case was No. 3, in which there was nine months' history. The length of illness varies therefore from three days to nine months, two cases lasted about a fortnight, two about six weeks, and two about eight weeks. The case lasting nine months stands quite alone, so we may conclude that usually the disease lasts eight weeks or less from the onset of definite symptoms.

Abdominal pain is frequently present, it is usually sharp, and often the report mentions that it comes on suddenly and then disappears, only to reappear. Usually this pain is said to be abdominal, but once it is stated to have been also present in the back. It bears no relation to the ingestion of food. Although often it is not mentioned, it is never stated to have been absent. Abdominal tenderness was not present except in one patient, and then deep pressure had to be made to produce it. Vomiting is mentioned in four cases, and in one the vomit contained blood, although the ulceration was limited to the large intestine. It is remarkable that in the very acute case in which the duodenum was affected there was no vomiting; but no doubt this and many other symptoms are often omitted in the reports of the cases, so that probably each of the symptoms may be taken as occurring more frequently than really appears. Diarrhœa was a striking feature. The man in whom it was absent died of perforation, possibly it would have appeared had he lived. The bowels were generally open very frequently, sometimes every two hours, and the diarrhœa is often described as being very severe. The motions were fluid, the colour was various, depending much upon whether there was any blood, only once is slime mentioned, once or twice it is stated to be absent; the amount of fæcal matter was small, a little mucus was to be seen in some cases. Sometimes

shreddy-looking masses like sloughs were visible in the motions. It is never stated that the motions were dysenteric, on the contrary, in Case 1 it is stated they were not. They were at times very offensive. The diarrhœa was not always continual, twice it alternated with constipation. Blood was present with the motions five times, but it is never described as incorporated with them, and twice it is stated that it was distinct from them.

In one patient in whom there was no perforation there was visible peristalsis and distension. Three of the cases are described as wasted, and two as anæmic, and several as being very collapsed, with a subnormal temperature in the last stage of their illness. In the first case the temperature was earlier in the illness, slightly raised, but later it became subnormal.

Simple ulcerative colitis may therefore be described as a disease occurring mostly in males, usually middle-aged. It generally lasts about two months, it is ushered in with attacks of abdominal pain, there is always diarrhœa, the motions are very fluid but never dysenteric, often foul and having blood in them, which is not intimately mixed with the rest of the motion. The diarrhœa is liable to alternate with attacks of constipation. Often there is vomiting. The usual course is for the patient soon to become sallow, to waste and to become weaker, and finally to die collapsed, with a subnormal temperature and feeble pulse. It may kill by perforation. It is sometimes associated with granular kidney. Cases differ very much in severity, and this is not surprising when we remember that the severity depends so much upon whether perforation takes place, whether there is much diarrhœa, and whether there is much loss of blood. It is to be noted that in not one of the eleven cases is it stated that there was any pus in the motions, and in the first and the ninth it is stated that there was none. This again supports my contention that probably simple ulcerative colitis does not arise from the follicles by their forming little abscesses which break down. It is clear that when Nothnagel (op. cit.) speaks of pus being one of the constant symptoms of intestinal ulceration he is not alluding to the disease I am now describing; nor again in my cases is mention ever made of the transparent particles of mucus, which are described as very characteristic of follicular ulceration.

The pain is probably to be explained by the tenesmus, which

is reflexly set up by the inflammation of the mucous membrane, and not to the exposure of nerves by the ulceration, for it is well known, from one's experience of tubercular and typhoid ulcers, that mere ulceration does not set up pain; and then also the suddenness of the pain is best explained by the hypothesis of its being due to tenesmus.

The vomiting is likewise reflex, as is also the diarrhœa; for if they were not they should bear some relation to the amount of ulceration, which they do not; and furthermore, the reflex theory also explains the alternating attacks of constipation. The blood comes of course from the exposed vessels, and as the ulceration is usually in the colon it is not mixed with the fæces.

The wasting is partly due to the vomiting, partly to the diarrhœa, and partly to the impairment of absorption that the ulceration must cause. The anæmia and collapse are easily explained by the loss of blood and diarrhœa.

As the reasons for regarding simple ulcerative colitis as a distinct disease from follicular colitis are scattered, partly in my pathological and partly in my clinical account, I may collect them together here:

1. The appearance of the two conditions is quite different.

2. The two forms of ulceration are never seen to pass one into the other.

3. The descriptions of the autopsies of simple ulcerative colitis make no mention of the affection of the follicles, and when in this condition the small intestine is also ulcerated, Peyer's patches are rarely described as affected.

4. Simple ulcerative colitis is chiefly a disease of the colon, although follicles are more numerous in the small intestine.

5. The mesenteric glands are not usually described as enlarged in simple ulcerative colitis.

6. Simple ulcerative colitis is usually uncomplicated by any other disease, and in all the cases which died it appears to have caused death; but follicular ulceration is usually complicated by other diseases, which generally cause death.

7. Perforation occurs in simple ulcerative colitis, but not in follicular ulceration.

8. Chronic Bright's disease is the commonest complica-

tion of simple ulcerative colitis, but is very rare in follicular ulceration.

9. Other intestinal lesions and tuberculosis are common in follicular ulceration, but very rare in simple ulcerative colitis.

10. Pus and transparent particles of mucus are not passed in simple ulcerative colitis, but they are both symptoms of follicular ulceration.

The cases appended to this paper show that the prognosis of ulcerative colitis is very grave, but I think I can show it is not necessarily hopeless.

Case 11, at the autopsy, showed several pigmented spots of old ulcers, so that there was here some attempt at healing; but of much greater importance is the following case, in which sloughs were passed from the bowel and yet the patient recovered. Besides, however, the sloughs, as pointing to the diagnosis, it will be seen that the patient was a middle-aged male; that he gave about two months' history of irregularity of the bowels, looseness alternating with constipation, that he was admitted with severe vomiting, abdominal pain, and some collapse; that the slight constipation he had on admission was soon replaced by diarrhœa, with blood in the motions, all of them symptoms which we have seen to be common in cases of simple ulcerative colitis.

James V—, about 30, was admitted for constipation and abdominal pain on May 5th, 1888. For two months before admission he had been irregular with regard to the bowels, sometimes they were open two or three times a day, sometimes he was constipated. He states that on May 1st whilst at work he had a sudden pain in the abdomen and had to go home. On May 2nd he felt a little better and worked for two hours. On May 3rd the bowels were open slightly, but there was no pain or blood on defæcation. He tried to work, but was obliged to give it up. He went home and was sick, and since then has vomited everything he has taken. This condition of great pain and vomiting continued till his admission at 6 p.m. on May 5th. He was sent to the hospital by the doctor who attended him, as a case of intestinal obstruction, probably intussusception or volvulus, for the bowels, excepting that they were very slightly open on May 3rd, had not been moved since the commencement of his illness.

On admission, he was very collapsed, with a drawn face, great tenderness on pressure of abdomen, constant severe abdominal pain, especially at the lower part of the abdomen, which was somewhat uniformly distended and tympanitic all over. No coils could be seen. He passed water shortly after admission. Pulse 120, but it soon sank to 70. Directly after admission he vomited a large quantity of dark brown, foul-smelling stuff looking like coffee. It was apparently from the stomach, although it smelt stercoraceous. The rectum was full of fæces. Mr. Lucas and I saw no satisfactory evidence of intestinal obstruction, so we ordered a large soap-and-water enema, and belladonna and opium pills. The patient had syphilitic sores on the legs, but no ulceration was felt in the rectum. The tongue was dry and furred; the legs were not drawn up. The enema brought away a quantity of scybala, but no blood. It was soon repeated, and more scybala came away.

May 6th.—Has vomited twice in the night; passed flatus from the anus. He still has the pain. At 4 p.m. he vomited, but the vomit did not smell nearly so foul. The bowels were very freely open; no blood; he felt much better.

7th.—Bowels open many times; motions loose, dark brown; occasionally vomits, but not foul-smelling stuff. The pain and tenderness are less.

8th.—Bowels open eleven times; motions liquid, green, shreddy; no blood; still vomits; pain less.

9th.—Bowels open frequently; motions as yesterday.

10th.—Passed a small, formed motion, with a little blood on one side of it; bowels open very often.

11th.—Still considerable diarrhœa, with some blood. The pain is less; there is no vomiting.

12th.—Passed five or six masses like sloughs; no organised structure could be made out under the microscope, but the membrane was crowded with leucocytes, and there were many loose cylindrical cells. One mass was in shape exactly like a Peyer's patch, and one was streaked with blood.

13th.—Bowels still open frequently, the motions contain blood, there is more abdominal pain; the abdomen is rigid over the left side, where there is much tenderness.

14th.—Vomited to-day; the motions are formed, but streaked with blood.

15th.—Condition better; bowels still often open, with blood in the motions; a little vomiting.

16th.—Bowels only open three times; is better, but still feeble.

The rest of the case may be summed up as follows:

The bowels continued irregular, being open two or three times every day till June 10th. The opium and belladonna pills, which had been previously given every four hours, were, on June 3rd, given three times a day. On June 4th he got up for the first time. On June 5th he was allowed some fish, on June 6th some chicken, and on June 13th middle diet. Shortly after this he was discharged from the hospital.

This case proves the possibility of recovery from ulceration of the colon, for the fact that, together with the symptoms of ulcerative colitis, there was the passage from the bowel of sloughs, one of which was shaped like a Peyer's patch, shows that in all probability this patient had ulceration of both the colon and small intestine. It also shows the importance of this disease in relation to acute intestinal obstruction, for the severe vomiting, the collapse, and the fact that the bowels had been confined a few days, caused the patient to be sent to the hospital as suffering from intestinal obstruction, a mistake that was rectified, and might possibly, if the symptoms at all accord with ulcerative colitis, be avoided in the future, by administering an enema before giving an opinion.

Case No. 5, also mistaken for intestinal obstruction, was much more deceptive: the slimy motions full of blood, and the abdominal pain, suggested malignant disease of the bowel, which diagnosis was fortified by a rectal examination that revealed a small ulcer and higher up a fleshy structure. The autopsy showed nothing but ulcerative colitis, probably the fleshy structure that was thought to be causing stricture was an islet of hypertrophied mucous membrane. These two cases show that ulcerative colitis must always be remembered when we are called to patients supposed to be suffering from intestinal obstruction.

To recapitulate, I have tried to show the symptoms which, when present during life, indicate simple ulcerative colitis; its pathological characters; that it probably does not arise from follicular ulceration; that although usually fatal yet recovery

is possible; and lastly, that it may easily be confounded with intestinal obstruction.

As confirming the opinion here expressed that this form of ulceration does not arise from the follicles, I may refer to a case recorded by Dr. Allchin in the 'Pathological Transactions' for 1885, p. 199. The patient was a middle-aged woman, who presented symptoms of weakness, diarrhœa, and melæna, such as have just been described. The post-mortem examination revealed typical simple ulcerative colitis, which Dr. Allchin remarks would ordinarily be called follicular ulceration of the colon. In his remarks on the case he points out that the disease is certainly not dysentery, nor is there any evidence of its being primarily a follicular process, and one reason against this is that it is mostly limited to the colon, although the follicles are also present in the stomach and small intestine.

The remarks which follow refer to other rare forms of intestinal ulceration.

Follicular ulceration.—The few cases that have been collected here do not show anything which is not already well known about this condition, nor do they teach us anything which was not previously known. The condition is far more common in the large intestine than the small; it consists in the disintegration of the solitary follicles, the result being many small round ulcers with sharply-cut edges, not at all undermined and not extending deeply. In a well-marked example the gut is quite honeycombed. I have not met with any case in which there was cicatrization, in fact none of the cases in our autopsical reports are even mentioned as healing, nor is perforation ever recorded. The mucous membrane between the ulcers is not at all affected in most patients, but even if it is the inflammation is not nearly so severe as in simple ulcerative colitis.

The well-marked example in the College of Surgeons Museum to which I have already referred was taken from the body of the Earl of Bristol, and it is stated that he suffered from vomiting of black fluid, with diarrhœa and melæna; and the twelfth case appended to this paper also suffered from diarrhœa. The patient was a child who had recently recovered from measles, and who was admitted for severe eczema. The case of the Earl of Bristol is too briefly recorded for us to be quite certain that the follicular ulceration was the cause of

death, and the child was a weak sickly creature, whose death, although accelerated perhaps by the ulceration, was not due solely to it. The remaining cases at the end of this paper were typhoid fever, tuberculosis, epithelioma of the rectum, and incarcerated hernia, all of them diseases sufficient to kill the patient, quite apart from the follicular ulceration; so that it appears at least doubtful whether this condition is of itself capable of causing death, and we have no certain evidence that the symptoms it produces are either severe or definite. It is a well-known and remarkable fact that follicular ulceration is sometimes found in phthisical patients, but that the ulceration of the intestine is most certainly non-tubercular. Another noteworthy fact is that three of the cases mentioned at the end of this paper were associated with other intestinal disease, viz. one of the patients had typhoid fever, another epithelioma of the rectum, and another incarcerated hernia.

Ulceration due to vascular obstruction.—Cases 18 and 19 were examples of growth that probably pressed upon the vessels. Case 20 was one of extreme atheroma of most of the vessels in the body, and No. 21 showed arterial thrombosis of the aorta and superior mesenteric artery. No. 8 suffered from endocarditis, and the spleen had infarcts in it, but there was nothing to show that the intestinal vessels were similarly affected, and the case has been placed among those of simple ulcerative colitis, of which disease it was probably an example.

Case 18 is of extreme interest, as there is evidence that the ulceration was due to an impediment in the flow of the chyle through the lymphatics by pressure on them of the retroperitoneal growth, for the writer of the report of the autopsy is of opinion that from the position of things this might very well have happened; the ulceration ran round the bowel, although the process was not chronic, and from this position it must have followed either the distribution of the lymphatics or blood-vessels, and lastly, in many places it was follicular. The mucous membrane was very vascular and angry looking, probably because the blood-vessels as well as the lymphatics were obstructed by the growth.

In the next case the obstruction was evidently severe, for at places the whole of the bowel was sloughing. The condition

seems in fact to have been a lesser degree of that which we find in cases of volvulus.

The point of interest about Case 20 is that the patient had not only ulceration and inflammation of the inner coat of the intestine as a result of the diminution in size of the orifices of the mesenteric arteries, but also inflammation of the outer coat as shown by the peritonitis which was present. It is strange that peritonitis was not present in either of the two cases 18 and 19.

The inflammation and ulceration found in Case 21 were, as might have been expected considering the nature of the vascular obstruction, very severe; peritonitis was found here also, and was very likely due to the blocking of the vessels, for there is no mention of perforation, but as there was a fæcal abscess outside the bowel this may have had some connection with the peritonitis.

It is very remarkable that three of these four cases showed no symptoms whatever during life which could be attributed to the intestinal ulceration, and in the first case the only symptom was that for twenty days before death the patient had severe diarrhœa. This absence of symptoms is quite inexplicable, and contrasts very strongly with the prominence of the symptoms in simple ulcerative colitis.

Severe inflammation of the intestine, associated with disease of the central nervous system.—In the 'Pathological Transactions' for 1885 Dr. Acland raises the very interesting question whether in diseases of the spinal cord we may not get an ulceration of the intestine comparable to other trophic lesions such as an acute bedsore. He records two cases of disease of the spinal cord, in both of which there were found small ulcers in various parts of the bowel. Both the patients had extreme distension of the intestines, and Dr. Acland is inclined to attribute to this some share in the production of the ulceration, so that the ulcers would be distension ulcers occurring in bowel which is more prone to ulcerate than it would have been if the spinal cord had not been affected.

The only case I have come across which at all bears upon the question is No. 22, a woman with double descending lateral sclerosis in whom four days before death very severe diarrhœa set in. The colon showed intense colitis; the mucous

membrane was rough, granular, and ecchymosed. As there was not distension of the bowel to complicate matters it may be that this case is more to the point than Dr. Acland's. Considering the small amount of material we have at hand, we may, I think, put the subject aside as one upon which it is impossible at present to form a definite opinion.

Ulcerations of the intestine due to perforation from without.—Of this rare condition two examples are recorded at the end of this paper. They were both of them cases in which peritonitis had matted together the intestines, between which little localised collections of pus had formed. These had burst into the intestine. In the first case all the ulcers led straight into the peritoneal cavity, but in the second one several of them did not. This case was examined by Dr. Mahomed, who regarded them as ulcers of the intestine perforating outwards, and so setting up the peritonitis; but Dr. Goodhart explains in the 'Pathological Transactions,' vol. xxxvi, where he records the case, that he considers the pus to have originated in the peritoneal cavity, but owing to its burrowing between the coats of the intestine, the opening on the peritoneal surface and mucous surface of the bowel did not correspond. As might be expected, in both cases, the ulcers were circular, clean-cut, and small. The peritonitis will naturally mask any symptoms due to the ulceration.

Distension ulcers.—These are well known, and I should not have referred to them here were it not that the cases I have collected show one or two points about them. In the first place, there is nothing particularly characteristic about the ulceration as regards the shape, position, &c., of the ulcer. Case 26 shows that it begins at a superficial ulceration; whilst Case 25 shows that, like any other form of ulceration if it last long enough, it will become transverse to the bowel. Nos. 25 and 27 show that sometimes sloughs form so that it would seem that ulceration of the intestine from distension is due either to the formation of small superficial ulcers, or that large sloughs form, which dropping off leave an ulcerated surface. When the sloughing is very severe peritonitis may be set up, and perforation of the distension ulcers is liable to happen. Two had nearly perforated in Case 26. No. 28 is of great

interest, because it shows that distension ulcers may heal, and that those farthest from the obstruction had been the first to heal. But it must not be therefore concluded that they were the first to form, for probably being some distance from the seat of obstruction they were slighter than the others; and also as the obstruction passed off, the most distant part of the bowel would be the first to feel the benefit. Although sometimes Peyer's patches and the solitary glands are much swollen, they are never mentioned as being ulcerated. The greatest distance above the stricture at which ulceration was found was six feet in a case of typhlitis. It is remarkable that in the case of cancer of the rectum, with distension and sloughing of the cæcum and considerable ulceration of the colon, that part of the bowel immediately above the stricture was not ulcerated.

The time that it takes for ulceration to form must vary very much with the amount of obstruction. In the case of volvulus recorded at the end of this paper there was only nine days' history, and yet the distended bowel was covered with ulceration.

The last case I have recorded was one to which my attention was directed by Dr. Goodhart. I have mentioned it because of its peculiarity, but I am quite at a loss to refer it to any of the other forms of ulcer described in this paper.

The following are the cases referred to in the preceding paper (the reference numbers refer to the records of autopsies at Guy's Hospital) :

Case 1. *Ulcerative colitis.*—Fred. C—, æt. 32, deal porter, came into Guy's Hospital first under Dr. Goodhart's care, and subsequently under mine, on February 10th, 1887, for pain in the abdomen and back, together with vomiting and melæna. Family history good. Previous personal history unimportant. Three weeks before admission, without any apparent reason, he had an attack of diarrhœa and vomiting with dull pain in the upper part of the right side of the abdomen. He left off work at once, but did not take to his bed till a week after. The motions continued loose till admission; once the bowels were open twelve times in the twenty-four hours. He first noticed blood a fortnight ago, but he may have passed some previously; it was always dark, somewhat clotted and mixed with fæces, which were never black or slimy. Since he has been in bed he has

vomited incessantly. The pain he has suffered from has borne no relation to his meals. His appetite has gone, and he has lost flesh considerably.

On admission.—The patient is a well-nourished man, with dark hair and complexion. The tongue is slightly furred and moist, the abdomen full and somewhat tense. The bowels were open three times in the last twenty-four hours; the motions were almost liquid, and contained several clots of dark-red blood, together with a little mucus and some fæces, but no pus. There is nothing else noteworthy about the patient. He died on March 19th. He gradually got thinner; he always had some pain in the abdomen, which generally came on shortly before the bowels were open. There was never excessive tympanites. Motions were passed between eight and twelve times a day. They were nearly always dark red and consisted of fluid containing a little fæces, together with several small blood-clots, and occasionally some yellowish bodies, looking like sloughs, but which broke down very easily. There was some mucus at times, but never could the motions be called dysenteric. There was occasional vomiting. Sometimes he would seem better for a day or two, but on the whole he got weaker and weaker, and died slowly, the pulse at last being hardly perceptible. The course of the temperature was irregular. Three evenings it reached over 101°. On nine days it was between 100° and 101°; it was often over 99°, but sometimes it was subnormal. Towards the end of his stay in the hospital it ranged a little lower than at the beginning.

Autopsy.—There was ulceration of the whole of the large intestine, beginning in the cæcum and extending to within four inches of the end of the rectum. The ulceration was almost universal, leaving, however, irregularly-shaped islets of swollen, congested mucous membrane. The edges of the ulcers were sharply defined. The floor consisted of exposed transverse muscular fibre. There was no attempt at repair, no perforation, peritonitis, or tubercle. The ulceration was least marked in the cæcum and rectum.

Case 2. *Ulcerative colitis with chronic Bright's disease.*—Jane S—, æt 44, admitted under Dr. Wilks July 21st, 1877. There was nothing in the history to lead anyone to suspect

intestinal ulceration. The patient was obviously suffering from chronic Bright's disease, cardiac hypertrophy, and bronchitis. On August 8th diarrhœa set in, and this, accompanied by abdominal pain, continued till death on August 22nd. For a few days before death the patient was much collapsed. At the autopsy there was found catarrhal inflammation of the small intestine. The large intestine was ulcerated all over with small ulcers running together in places to form large ones. The mucous membrane was black, but not thickened or sloughy. The kidneys were very granular. (Reference 1877, 295.)

Case 3. *Ulcerative colitis.*—Emma R—, æt. 17, admitted under Dr. Goodhart. Had always been delicate, more so the last year. During the last nine months the abdomen has gradually increased in size, and she has had occasional sudden pain in it. During this time the bowels have been irregular, diarrhœa alternating with constipation. For the last three weeks there has been diarrhœa, the patient being unable to retain the motions, which have been dark and offensive. On admission she was anæmic, with a pulse of 128. The abdomen was distended and the peristalsis visible. There were hard masses to be felt here and there, but the abdomen was resonant all over. There was no albumen in the urine. Six days after admission, the pain became very severe, she lay with her legs drawn up, and the day after she died. At the autopsy the colon was found to be enormously distended, the sigmoid flexure lying in the right iliac fossa. This distension began suddenly at the hepatic flexure, and gradually increased from that point. There was a little foul gas and a small quantity of greenish purulent fluid in the abdomen. There was a small perforation in the sigmoid flexure through which fæces could be extruded. There was a little recent lymph in the intestine. An enormous quantity of black pultaceous fæces washed out from the bowel, but there were no scybala. Two superficial ulcers could be seen close to the anus, each of the size of half-a-crown, and more or less oval. A little higher there were two others, and in the sigmoid flexure was a long one with sinuous margins, and in the centre of it was a sloughing perforated patch; higher still the mucous membrane was eroded,

leaving the transverse muscular fibres exposed. The surface of the ulcers was smooth, the edges were thick and rounded, and the muscular coat was much hypertrophied. The rest of the intestine and all the other organs of the body were healthy. Circumferences: cæcum 7½ inches; hepatic flexure, sigmoid flexure, 13 inches each; rectum 17 inches; ileum 32 inches. (Reference 1880, 309. Preparation in the museum, No. 1860[41].)

Case 4. *Ulcerative colitis, small intestine affected.*—James M—, furniture dealer, æt. 59, was admitted under Mr. Cooper Forster for fractured thigh. The only abdominal symptom was great tympanites; he gradually sank and died. At the autopsy there was severe suppurative peritonitis with several perforations of the intestine about the cæcum. The mucous membrane of both large and small intestine was ulcerated over large areas; sometimes the whole circumference was affected. The mucous and exposed muscular coats were shreddy, and the mucous membrane was undermined. This condition was worst in the transverse colon, but was more or less marked over the whole of the large intestine. The intestinal contents were fluid, but contained no blood; Peyer's patches at the lower part of the ileum were very prominent and slightly ulcerated. The mesenteric glands were slightly enlarged, the vessels were healthy, there was a small ulcer in the stomach. The toe-joints contained urate of soda. (Reference 1879, 187.)

Case 5. *Ulcerative colitis.*—James R—, gardener, æt. 49, admitted under Mr. Bryant's care. His bowels have always been relaxed. Six weeks ago he first felt pain in the stomach when passing a motion, which he noticed was tinged with blood, which since then has often come away when no motions are passed. Coincident with this there has been much diarrhœa, and latterly the motions have often consisted of nothing but blood and slime; and at other times some fæces have been mixed with them. The last week or so the bowels have been open six or seven times a day. On admission, he was much emaciated, and stuff like red-currant jelly was passed from the rectum six or seven times a day. There was much abdominal pain: a small ulcer could be felt just inside the rectum; and under chloroform, high up the rectum, the impression was given of a fleshy

structure. Left lumbar colotomy was performed. This made no difference in the condition of the patient, who continued to pass, from the anus, slimy motions mixed with much blood. He gradually sank and died thirty-one days after admission, and twenty-one after the operation. At the autopsy the small intestine was found to be healthy, but the large was excessively ulcerated throughout. The mucous membrane was only represented by projecting eminences, some almost sessile on an ulcerated floor. This condition of things extended from the anus up to one or two inches from the cæcum, where it ceased abruptly; but in the cæcum was another isolated patch of irregular ulceration, not unlike that lower down. In one or two places, where the destruction was not very great, it was evident that the disease had a tendency to run along the mucous membrane of the longitudinal muscular bands. There was no stricture. Just inside the anus the ulceration had made its way into the tissue outside the bowel. Every other organ in the body was healthy. (Reference 1882, 376.)

Case 6. *Intense colitis, with superficial ulceration, in a case of tuberculosis.* (It will be seen from the text of the paper that the exact position of this case is doubtful.)—Wm. A—, æt. 45, a wine cooper, admitted under Dr. Wilks. The only symptoms referable to the intestine were considerable diarrhœa and vomiting for a few days before death. The autopsy showed tuberculosis of the genito-urinary tract. Near the cæcum the mucous membrane was prominent, and covered with yellowish adherent lymph. It was superficially ulcerated. This condition increased in severity, reaching its maximum in the middle of the transverse colon. (Reference 1879, 69.)

Case 7. *Ulcerative colitis, with cerebral softening.*—Robert T—, æt. 25, a coachman, admitted under Dr. Moxon. The breath and tongue were very foul. There was history of vomiting and diarrhœa for sixteen days before death. The vomit and the fæces were both bloody and very foul. The autopsy showed the colon was very severely ulcerated from the cæcum downwards, with neither lymph nor sloughs. There was also granular kidney and cerebral softening. (Reference 1879, 107. This specimen is in the museum, No. 1864[50].)

Case 8. *Acute colitis with ulceration.*—Henry B—, æt. 56, admitted under Dr. Pavy. He was a silversmith. He was dark brown all over like a mulatto, and had severe purpura hæmorrhagica with receding of the gums. There was diarrhœa, and the bowels were open five times a day. He gradually sank and died. He was in the hospital in 1874 for purpura. At the autopsy he was found to have fungating endocarditis, cirrhosis of the liver, and an enlarged spleen with infarcts in it. The greater part of the colon was excessively vascular, superficially ulcerated, and coated with a thick layer of very tenacious gelatinous lymph. The outer coats were not implicated. The contents were ochre yellow. (Reference 1884, 162.)

Case 9. *Acute enteritis, with ulceration.*—Sarah P—, æt. 54, admitted under Dr. Fagge for abdominal pain and sickness. She has always had constipation. Five or six weeks ago she was seized with griping pain in the lower part of the abdomen whilst taking a meal; after this the bowels were constipated for five days, at the end of which time they were open, the motions being pale yellow. Since this she has had pain in the abdomen at different times, especially at night, and bearing no relation to food. She has vomited twice daily, and the bowels have only been opened by medicine. No blood or pus has been passed, but there has been considerable loss of flesh.

On admission, she was much emaciated. The abdomen was distended and tympanitic, tender on deep pressure. The coils were visible; pulse 60, irregular, and feeble. Hands and feet cold; tongue dry and red. She died in twenty-four hours, cold, collapsed, and in great pain. During this time there was some vomiting, the bowels were frequently open, the motions were thick, fluid, and of a greenish-yellow colour.

On opening the abdomen the peritoneal surface all over looked shaggy from peritonitis of some date. The serous membrane had small patches of thick lymph upon it, and a quantity of turbid, almost purulent fluid had gravitated into the flanks and pelvis. The coils of intestine were moderately and equally distended. There were no perforations of the intestine to be found, but there was a small slough in the ileum quite sufficient to set up peritonitis. The whole of the

ileum was very dark and evidently much inflamed. There were no coagula in the vessels of the mesentery. The lower twenty-six inches of the ileum were of a claret colour and honeycombed by ulcers. The mucous membrane was sloughy looking and swollen, but there was no thickening of the coats beneath. The ulcers were very numerous, of various shapes, and many had extended through the mucous membrane and had a slightly thickened edge. Some were in Peyer's patches, others were not. Those which had affected the patches had done so in a very peculiar way. The patch was hardly thickened at all, but was cut into transverse bands by ulceration extending across at various levels, with alternating bands of fairly healthy mucous membrane. Many Peyer's patches were swollen and fleshy looking. Some ulcers ran right round the bowel. There was much ulceration in the cæcum and colon. The ulcers were here mostly solitary, and were covered by large superficial sloughs surrounded by a claret-coloured zone. They extended as low as the sigmoid flexure.

Kidneys, capsule adherent; a few cysts. The microscope showed thick vessels and intertubular nucleation. This case is peculiar in that there were several stages of intestinal ulceration, which was chronic above and acute below. A piece of the intestine is in the Guy's Hospital Museum. (Reference 1882, 22.)

Case 10. *Acute ulcerative enteritis.* — John W—, æt. 45, admitted under Dr. Goodhart. His work is to carry sacks. He gave no history of any previous illness. Three days ago he was taken with diarrhœa and abdominal pain, both of which were very severe and continued till admission, when he was found to be in a very collapsed condition with a pale and livid face, cold and livid extremities, covered with sweat; the pulse could hardly be felt; the legs were drawn up, the abdomen was rigid, but not tender. He died collapsed soon after admission. During his illness he took nothing but milk. At the autopsy it was found that beginning at the duodenum and occurring at considerable intervals down to the end of the ileum, were eight or ten round ulcers the size of a sixpence with a sloughing black and white surface, which could easily be scraped off; round each ulcer was a very red halo of congestion, and the corres-

ponding peritoneal surface of the gut was intensely congested. In the large intestine were several much larger ulcers, around which there was much congestion and thickening of the mucous membrane. Peyer's patches were healthy. (Reference 1878, 209.)

Case 11. *Ulceration of intestine.*—George B—, a gardener, æt. 36, admitted under Dr. Wilks. He was quite well till two months before admission, when he became sallow and excessive diarrhœa set in. On admission, he was very weak with a subnormal temperature; he was passing much blood from the rectum, and had purpura on the back. He died collapsed five days after admission. At the autopsy the upper half of the duodenum was healthy; below this there were numerous places where there was extensive ragged ulceration all round the bowel, the mucous surface being in many situations completely destroyed. The ulcers seemed to begin at the angle of reflexion of the valvulæ conniventes. There was no thickening of the edges, but much dark slaty pigment in the submucous tissue. This ulcerative condition extended a short way into the jejunum, then there came a merely pigmented surface for some distance, then a length of four inches excessively pigmented and ulcerated, and further on another four inches of ulceration. The last part of the ileum was healthy. In the cæcum were one or two ulcers. In both the large and small intestine were several pigmented spots of old ulcers. (Reference 1877, 155.)

Case 12. *Follicular ulcers.*—Bridget S—, æt. 1 year and 11 months, admitted under Dr. Moxon for eczema. Measles three months ago. The child had diarrhœa when she came in, and from this she gradually sank. All throughout the small and large intestine were tracts of intense congestion mostly on Peyer's patches. There was not much swelling. There were several small superficial follicular ulcers. (Reference 1880, 12.)

Cases 13 and 14. *Extensive non-tubercular ulceration of large intestine in cases of phthisis (probably follicular).*—Bridget D— was under Dr. Pavy, in Miriam, and Joseph H— under Dr. Habershon, in Philip.

The report of the autopsy of both these cases states that there was extensive ulceration of the large intestine, which was certainly not tubercular. (References 1880, 21 and 39.)

Case 15. *Colitis and non-typhoid ulceration (follicular) in a patient suffering from typhoid.*—Charles G—, æt. 17, admitted under Dr. Fagge. Patient had typhoid fever with a relapse, and death from hæmorrhage. The small intestine contained many healthy typhoid ulcers. The large intestine showed intense colitis. The mucous membrane was swollen, velvety, and covered with multitudes of small, sharply-cut ulcers, certainly not typhoid but very like acute dysentery. (Reference 1880, 351.)

Case 16. *Follicular ulcers.*—Patrick K—, æt. 33, was admitted under Dr. Pavy. There was found at the autopsy epithelioma of the rectum with follicular ulceration of the large intestine, which was quite honeycombed by it. The mucous membrane of the lower part of the ileum was granular, thick, and showed a few small follicular ulcers. (Reference 1884, 336.)

Case 17. *Follicular ulceration secondary to hernia (incarcerated).*—Jane N—, æt. 44, admitted under Mr. Jacobson. She was operated on two years previously for femoral hernia. When she left the hospital she threw away the truss she was told to wear. The gut came down sixteen days after she was readmitted to the hospital when an operation was performed. During the time between the operation and her death the wound did well, but the patient vomited continually, the tongue was very red, there was a slight rise of temperature, and she gradually became weaker and weaker. Two days before death the parotid glands became tender, and by the time of death they were suppurating. At the autopsy it was found that the part which had descended was the lower part of ileum. For thirteen feet above this there was extensive ulceration, the ulcers being small pits arranged in clusters, but by no means exclusively on the mesenteric surface. The cause of this ulceration was very obscure. (Reference 1881, 212.)

Case 18. *Follicular ulceration of colon; retroperitoneal growth.*—Joseph L—, æt. 58, was admitted under Dr. Wilks. He had never been abroad, and the only symptom bearing upon the intestinal ulceration was that he had severe diarrhœa for the thirty days previous to his death. At the autopsy it was found that there was colloid cancer of the stomach, and that the retroperitoneal glands formed a large cancerous mass. The large intestine was extensively ulcerated from the cæcum onwards. The ulceration ran round the bowel in a linear fashion, not destroying it all the way round, but in a follicular manner by small ulcers closely set, giving a trabeculated arrangement, the trabeculæ being still unaltered mucous membrane. In many parts the ulcers occupied a large strip of intestine, in others they had so extended as to implicate the entire mucous surface of the affected part. The lower part of the large intestine was the least involved. The mucous membrane was very vascular and angry looking, indicating that the ulceration was recent. As regards the cause, no plugging of the vessels could be found, but the mass behind the aorta must have caused some vascular obstruction, and further it is not improbable that the lymph stream was blocked. The capsule of the kidneys was adherent, but the organs looked good. (Reference 1882, 350.)

Case 19. *Ulceration of small intestine with growth in mesentery.*—Margaret S—, æt, 50, was admitted under Dr. Moxon for uræmia, and shortly died. No satisfactory history pointing to the intestinal lesion was obtained. The autopsy showed arterio-capillary fibrosis, softening of the bones in many parts of the body, and a large lymphomatous mass in the mesentery. The corresponding part of small intestine was in parts deeply stained with bile, and sloughing *en masse*. In other parts it had sloughed, leaving an ulcer, and at one spot there was a surface three inches long devoid of any mucous membrane. The whole of the affected bowel was much swollen and ecchymosed. (Reference 1881, 222.)

Case 20. *Ulcerative colitis with atheroma of aorta.*—John T—, æt. 66, admitted under Mr. Bryant. The patient had gangrene of the legs. At the autopsy it was found that the

vessels were more atheromatous than in any other specimen that had been examined at Guy's Hospital for many years. There was purulent peritonitis, cystitis, and the colon was extensively ulcerated. Some of the ulcers were recent and injected; in others there was no injection. The ulceration gave to some parts of the colon a worm-eaten appearance. The mesenteric vessels were not atheromatous nor thrombosed, but the atheroma of the aorta had much diminished their orifices. The kidneys were granular. (Reference 1880, 110.)

Case 21. *Ulceration of intestine secondary to arterial thrombosis.*—Mary J—, æt. 49, admitted under Mr. Howse. She had gangrene of the leg. At the autopsy there was found thrombosis of the femoral artery, of the aorta, and of the superior mesenteric artery. The stomach was dilated. There was peritonitis, and the coils of intestine were adherent. There was a communication between the ascending colon and small intestine, and also between the descending colon and small intestine; in connection with the latter communication was a localised fæcal abscess. The descending colon contained numerous small pigmented ulcers, probably of some date. Just below the cæcum was an extensively longitudinal ulceration with sharply defined irregular dentate edges; it extended into the muscular coat; the mucous membrane around was very congested. In the small intestine the mucous membrane was also much congested and somewhat thick, blotched all over with irregular sloughy ulcers of various shapes and slightly thick borders. Payer's patches were healthy. This case is recorded in the 'Pathological Society's Transactions.' (Reference 1878, 53.)

Case 22. *Intense colitis associated with cerebral disease.*—Emily R—, æt. 40, was admitted under Mr. Davies-Colley. Six years before she began to suffer from weakness of the legs and blindness. She was admitted for a distended bladder; the urine was drawn off. There was nothing to point to an affection of the bowels till four days before death, when very severe diarrhœa set in. Under this she sank and died. The autopsy showed atrophy of the brain with descending sclerosis of the lateral columns of the cord on both sides, contracted mitral

valve, gouty deposits in the toes, hypertrophy of the bladder, cystitis, pyelitis, and intense colitis; the mucous membrane was rough, granular, and ecchymosed all over. Its coats felt thick. (Reference 1882, 126.)

Case 23. *Ulceration of Intestine due to Perforation from without.*—Charlotte B—, admitted under Dr. Moxon. She was quite well till three weeks before admission, when she began to suffer from pain in the abdomen with occasional diarrhœa and sickness. These symptoms were present when she came in, and continued the same for some weeks, when she died. At the autopsy there was found an abscess of the right ovary, which had set up peritonitis. The intestines were all matted together. In the cæcum was an ulcer the size of a shilling, opening straight into the peritoneal cavity. Higher up in the cæcum and in the ascending colon were five or six others, all exactly similar and all perforating. These ulcers were all of them probably due to perforation of the intestine from without, as a result of the peritonitis. (Reference 1877, 410.)

Case 24. *Ulceration of intestine, associated with purulent peritonitis; probably perforation from without.*—Annie K—, æt. 18, admitted under Mr. Davies-Colley March 15th, 1883. On Feb. 6th, 1883, she caught cold, and began to suffer from abdominal pain and diarrhœa. Feb. 7th, bowels open eighteen times. She got a little better, but remained very weak from nearly constant diarrhœa till admission, when she had slight œdema of the limbs. The legs were drawn up, the tongue dry and foul, pulse weak, 116; abdomen distended, bowels very relaxed, motions watery with a trace of albumen in the urine. There was an abscess in the iliac region, which was opened, but the patient gradually sank and died on April 17th, after having had diarrhœa constantly during the time she was in the hospital. The intestines were all matted together by peritonitis, and between them were numbers of abscesses, one of which had travelled down and opened in the iliac region, where it was opened. In both the large and small intestine were many clean-cut ulcers measuring three eighths by one eighth of an inch, generally grouped together and many of them perforated. Dr. Mahomed looked upon them as ulcers of the intestine, which perforated outwards;

but Dr. Goodhart regarded them as due to perforation into the intestine of the peritoneal abscesses. (Reference 1883, 146.)

Case 25. *Cancer of rectum; extreme distension and ulceration of colon; sloughing of the cæcum; peritonitis.*—John W—, æt. 35, admitted under Dr. Moxon in John Ward, on March 17th, 1881, with a history of which the following is a brief extract:—At the beginning of last January, after breakfast, he was suddenly seized with vomiting and purging, accompanied by the passage of blood from the anus. He had much pain at the time, but got better and went to work. Three weeks before admission he had another attack of pain, and being much constipated he took eight or ten pills daily for three days, and was much purged after them. He does not appear to have relieved himself by such means, for he came into the hospital for abdominal pain and distension.

The autopsy revealed in short what is stated at the heading. More in detail:—The intestinal coils were adherent by soft lymph in all parts, but more particularly over the cæcum, to which the omentum was fixed. The cæcum was enormously distended, occupying about a third of the abdominal cavity. The colon was also much distended down to the rectum. Some of the small intestine (a coil of ileum two feet from cæcum) was adherent to the bottom of Douglas's pouch, and when removed an abscess was opened in this region. This originated in ulceration of the rectum above a cancerous stricture four inches from the anus. The lower part of the bowel was healthy. The stricture, which was a tight one, consisted of an ulcer with everted sinuous edges infiltrated by a soft cream-like vascular growth, the tissues outside the bowel being thickened by soft white medullary growth.

The mucous membrane above the stricture for a foot or more was quite healthy, though the bowel was much dilated. Then there came another six or eight inches in which there was extreme ulceration, so much so that hardly any mucous membrane remained. The cæcum had a large, irregular, sloughing patch in it, and the ascending colon one or two ulcers, like any chronic ulcers might be, with a little thickening of the edges and running in the transverse direction of the bowel.

The small intestine, although distended, was not unhealthy.

None of the bowel, small or large, was markedly hypertrophied.

Case 26. *Distension ulcers.*—Elizabeth M—, æt. 42, admitted under Dr. Goodhart for intestinal obstruction of nine days' standing. At the autopsy there was found volvulus of the sigmoid flexure and acute colitis. The distended sigmoid was covered with irregular ulceration of its mucous surface. Most of the ulcers were superficial. Two were deep and nearly perforating. (Reference 1884, 150.)

Case 27. *Distension ulcers.*—John N—, æt. 14, admitted under Dr. Taylor for typhlitis, the first symptoms of which came on nineteen days before death. For the first few days there was considerable diarrhœa. At the autopsy the appendix, which had a calculus in it, was found to be perforated. The stomach, duodenum, and jejunum were normal. Ileum was dilated and hyperæmic. Peyer's patches were large and swollen; there was no actual ulceration, but there were sloughs opposite the attachment of the mesentery. (Reference 1884, 94.)

Case 28. *Distension ulcers after typhlitis.*—John C—, æt. 15, admitted under Dr. Wilks. Has had dyspeptic symptoms all his life. Diarrhœa three months before admission. Ten hours before admission he was attacked with abdominal pain and vomiting. The abdomen was much distended, and peristalsis was visible. He remained in this condition with constipation for twelve days, then the bowels were open naturally. His condition up to the time of his death varied, but on the whole he had much abdominal pain, visible peristalsis and diarrhœa, with wasting and increasing weakness. For some days there was much sickness. He gradually sank and died three and a half months after admission. The autopsy showed typhlitis, the solitary glands all down the small intestine were very prominent, the lower part of it was very much dilated. Six feet from the cæcum up the ileum the ulcers began and increased in number from above downwards. The upper ones were healed, the others healing and healthy. The healed ones were indurated by pigmented patches. The ulcers were irregular in shape and size. (Reference 1884, 103.)

Case 29. *Ulceration of doubtful nature; strangulated inguinal hernia; operation; ulceration of Peyer's patches of doubtful nature; acute swelling of mediastinal glands with caseation.* —Frank H—, æt. 3, under Mr. Golding-Bird in Martha. He had had a hernia in right groin from birth, which had several times disappeared. It came down the day before admission, and he vomited all day. Taxis was applied, and being unsuccessful he was sent to the hospital, and Mr. Golding-Bird found it necessary to operate. The patient's temperature afterwards was 102°, but he had no serious symptoms, and he died unexpectedly. Careful inquiry was made as to his previous history. The child had been ailing for a fortnight, though not with any definite symptoms.

The autopsy showed as follows:

The mediastinal glands were enlarged, though not much so. They were chiefly remarkable for an intense congestion rendering them a dark claret colour, and on section some contained minute points of pus in them, one a tough, yellow elastic mass of chronic formation. Had it not been for this mass one would have called the condition one of acute suppurative inflammation, and unquestionably much of the disease was of this nature, but the yellow colour and chronicity suggested some acute caseous change of tubercular nature.

As regards the abdomen there was no peritonitis. A knuckle of congested small intestine lay near the right internal ring, but it was not by any means in a bad condition. There was a remarkable amount of œdema or inflammatory thickening of the mesentery which might have caused a persistent obstruction, inasmuch as it made a large hard mass in the mesentery and caused the knuckle of intestine to bend sharply. There was a good deal of extravasation of blood into the mesentery, and on section of the thick part some of the swelling was found to be due to glands in a similar state of congestion (not suppuration) to those in the mediastinum. The corresponding mucous membrane was found to be ulcerated in a somewhat peculiar way. The Peyer's patch opposite, rather a long one, had in it six or seven small ulcers with very vascular edges quite like early tubercular ulcers with rough ragged edges. The entire intestine was similarly affected, though not always to a like extent. Thus, from the hernial knuckle, which was about six

inches from the ileo-cæcal valve, down to this structure the whole mucous surface was swollen and covered with small ulcers, not unlike a case of severe typhoid fever in an early stage. Above it the disease gradually diminished, and the least affected part showed a slight general swelling of the patches with two or three small points of more excessive swelling and ragged or villous-looking vascular erosion on the surface. These, again, were very like early typhoid ulcers, as was also the intense congestion of some of the glands. The colon was extensively ulcerated in the upper third of its length, the mucous membrane being swollen and injected and covered with small follicular ulcers. The mesenteric glands were all much enlarged in the abdomen, but the majority were pale, none were caseous. A careful examination was made for tubercles, but none were found in any of the viscera.

ON A

CASE OF CANCER OF THE TONGUE,

WITH NOTES UPON ALL THE

CASES OF CANCER OF THE TONGUE TREATED IN GUY'S HOSPITAL IN THE YEARS 1883 TO 1887.

(*Being a portion of a Paper which won the Gurney Hoare Prize in* 1887.)

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(Communicated by the Editors.)

Isaac B—(1),[1] æt. 72 (2), a travelling optician, was admitted to Naaman Ward, under Mr. Jacobson, on October 6th, 1886, suffering from an ulcerated mass on the left side of his tongue.

Family history.—His parents enjoyed good health and lived to a good old age. He is one of a family of six; his two brothers and three sisters are all alive, and in good health to the best of his knowledge.

There is no history of cancer (3) in the family.

He is married, and has had seventeen children, all of whom are alive and in good health.

Personal history.—In 1839, when twenty-five years of age, he had a slight attack of syphilis (4), but this was followed by no constitutional effects; all that he can distinctly remember is that he had a single hard sore (of which there is no trace at the present time), but he says he sought medical advice, and was told that it was a syphilitic chancre. He has had no subsequent form of the disease, unless it be this present disease of his tongue.

[1] The figures in brackets refer to the notes in the commentary.

About forty years ago, in 1846, he became liable to sores and ulcers on his tongue. These were more or less temporary and variable, but his tongue was never quite free from sore spots; they were not confined to any particular part, but would occur first on one side, and, as these were disappearing, others would appear on the other side or on the tip. For this he sought advice at Falmouth, and there he had his tongue cauterised (5) with lunar caustic. He attributed these sores to his smoking (6) constantly a clay pipe, and says he supposes he smoked three ounces of coarse tobacco a week at that time. He was not a total abstainer, but did not drink to excess; and says he never cared for undiluted spirits. This local treatment gave him no relief, and for three years more he went on smoking as before, and his tongue continued sore and painful.

In 1849 he went to St. Bartholomew's Hospital and was treated as an out-patient. There he was told that no cure could be effected unless he gave up his tobacco, which he determined to do, and since then he has not smoked. He had some "wash" given him with which he was directed to rinse his mouth constantly, but he can give no description of it. As the result of this treatment, and of his abstinence from tobacco, his tongue improved slightly, but continued tender for the succeeding five or six years, during which period he ate and drank only of cold things.

By 1851, however, his tongue again got worse, and he then sought medical advice in Plymouth. There he was treated, according to his own account, with mercury and iodide of potassium (7). Under this treatment his tongue got quite well, and he was able to eat or drink anything hot or cold.

Up till the present year, 1886, he continued in this state, and, as he says, "forgot all about his tongue."

Unfortunately he can give no account of the appearance of his tongue during all this period, nor can he give the names of those medical men whose advice he sought.

History of present disease.—In March of the present year, 1886, *i. e.* seven months (8) before his admission, he again found his tongue getting sore, and noticed a small pimple (9) on the left side (10) about one inch from the tip. He can assign no exciting cause; he says it is the side on which he used to smoke, but his abstinence from tobacco had been

absolute for thirty-five years. He does not think it was due to irritation (11) by any rough or sharp tooth.

He consulted several medical men, none of whom did him any good, though he had it cauterised, and also had "washes" prescribed for him.

He then determined to go into hospital, and was admitted at Swansea, and there treated medicinally. Finding that he got no relief he came to London, prepared for an operation if necessary.

Condition on admission.—A fairly well-preserved man for his age; thin, but not emaciated. Does not think he has been losing flesh of late. He presents no symptoms (12) of any severe constitutional disease, but his face is pale and gives the impression of constant pain.

He presents no symptoms of pulmonary disease, and, according to his own account, his digestive system is sound. His urine is normal.

On examining his tongue, the middle third of the left half presents an ulcerated surface (13) of about one inch antero-posterior diameter, and one third of an inch in transverse diameter. The ulcer is seated on the side of the tongue, involving very little of the dorsum, and not reaching the floor of the mouth by half an inch. The edges of the sore are hard, rugged, and everted. Its surface is uneven, and presents pale flabby granulations of very unequal size, and is covered with small patches of fetid greyish slough, which cannot be wiped off without much difficulty. The base is indurated, but this induration is very limited. There appears to be very little discharge, the slough above mentioned being the only material lying in the cavity. The ulcer itself is exquisitely tender at its anterior part, but does not appear to be very painful; in fact he complains far more of pain in the left ear and temple (14), and in the temporo-maxillary articulation during mastication. The ulcer, as a whole, is shallow, its floor being little beneath the level of the surrounding parts, but its apparent depth is greater owing to the elevated margin that surrounds it.

On the dorsum of the tongue about one fourth of an inch posterior to the ulcer there is to be seen a leucomatous patch (15) running transversely across the right half of the tongue, being in all about half an inch in length. Between the left hand

extremity of this patch and the edge of the ulcer is a piece of tissue that appears healthy.

The floor and mucous membrane of the mouth do not appear to be in any way involved, though he complains of a slight aching pain in the gum opposite the ulcer of the lower jaw. The mobility (16) of the tongue is practically unimpaired.

At first no enlarged glands (17) were detected in either submaxillary region or in the neck; but a few days later, after the patient's beard had been removed, a small gland of about the size of an almond was detected below and in front of the angle of the jaw on the left side. This gland was hardly indurated, but could be felt with abnormal distinctness. It was freely movable on the subjacent parts.

Diagnosis (18).—Cancer (19).

Treatment (20).—On October 8th Mr. Jacobson operated in the theatre, chloroform (21) being the anæsthetic used, administered at first with a Junker's inhaler and afterwards merely by the tube deprived of the mask, and also on folded lint.

As soon as anæsthetised the patient was raised (22) and several pillows put under his head and shoulders, so that the trunk and head were at an angle of forty-five degrees with the table, but care was taken not to bend the head forward on the chest.

The face being turned slightly to the right, on which side the operator stood, the mouth was opened, and an assistant, standing on the patient's left, with his left thumb and forefinger compressed the facial vessels in the tissues of the left cheek, at a point opposite the alveolus of the lower jaw. The operator meanwhile with his left hand commanded the facial vessels at a point half an inch higher up, while with a scalpel he divided (23) the left cheek horizontally from the angle of the mouth to the anterior border of the masseter. The bleeding points were seized with forceps and twisted. The hæmorrhage was only nominal. A modified Mason's gag was then placed in the right side of the mouth, and after the left inferior canine had been extracted (which was the solitary tooth on that side of the lower jaw, and was considerably in the way), the head was turned (24) well to the left. The gag was maintained in position by a second assistant standing behind the

patient's right shoulder; the first assistant, standing on the patient's left, was entrusted with the sponges fixed on holders, while the operator stood on the patient's right hand about opposite the shoulder.

The first step in the operation was to pass a stout silk ligature on a sharp curved needle, from below upwards, through the substance of the tongue about three quarters of an inch from the tip and about a quarter of an inch to left of the middle line. The needle was withdrawn and the two free ends of the silk were passed through the loop left projecting from the dorsum, and then knotted together. Holding this in his left hand the operator drew the tongue upwards and forwards out of the mouth, and then entered a sharp-pointed curved bistoury into the under surface of the tongue a trifle to the left of the frænum, and let the point appear just to the left of the middle line of the dorsum one inch and three quarters from the tip, and thus at a point posterior to the ulcer. With one sweep forward the tongue was divided (25) longitudinally a trifle to the left of the raphe. Very little hæmorrhage was caused by this manœuvre.

Then with a pair of round-pointed straight scissors the mucous membrane between the tongue and the left alveolus of the lower jaw was divided by short successive snips, starting from a point just to the left of the frænum, and following the curve of the jaw till a point just below the left anterior pillar was reached. Meanwhile the operator, holding (26) the suture in his left hand, drew that part of the tongue in whatever direction seemed most convenient. The hæmorrhage during this part of the operation was of a rather free oozing character, and the sponges were in constant requisition in order that the path for the scissors might be fairly seen. The incision was next continued (still with scissors) in a direction inwards and backwards (thus forming an obtuse angle with the previous incision), but the track cut was not very deep, only the superficial structures being divided, viz. the end of the stylo-glossus and palato-glossus, and the cortex (27) of the tongue. This incision was carried to the point where the bistoury had emerged when first thrust through the tongue, *i. e.* about half an inch in front of the epiglottis.

As soon as in the step just described the fibres of the stylo-

glossus were divided the tongue came (28) freely forwards on slight traction being made with the left hand.

A blunt director (29) was then used, and with it the soft tissues of the tongue were torn through transversely a quarter of an inch behind the ulcer (the previous division of the cortex permitting of this) until the lingual artery was detected. A pair of torsion forceps was then inserted horizontally through the posterior extremity of the buccal incision, and the artery thus caught in its continuity. As soon as the forceps were clamped they were given to an assistant to hold, and the artery was divided on the distal side. With a few more snips of the scissors the genio-hyo-glossus on this side was divided on the plane of the floor of the mouth, and the left half of the tongue removed. The lingual artery was now twisted, and neither now nor at any subsequent period was there any bleeding from it. Such, however, was not the case with a small vessel in the (30) floor of the mouth that was divided when the genio-glossus was snipped away, for there was obstinate oozing at this point, the blood welling up into the floor, nor was it found possible to control this either with sponge pressure or with cold. Finally the bleeding point was picked up with forceps, and ligatured with chromicised gut. The very slight oozing that persisted was soon checked by the application of ice in muslin bags.

The cheek flaps were then brought together and a harelip pin was used to hold them in position, placed half an inch from the angle of the mouth, while the edges of the wound were united with six sutures of fine silk. The whole incision was then painted with collodion on to which iodoform was dusted. Over all was placed a flat sponge saturated with iodoform, and this was secured in position, the jaw at the same time kept shut by a jaw bandage.

After being taken back to bed he was given a quarter of a gr. Morph., which dose was repeated at midnight since he was restless. One hour after the operation his pulse was 80 and fairly strong, and his temperature 98·6°.

9th.—Patient has slept well since midnight. His temperature this morning is 98·2°. For diet (31) he was ordered a pint and a half of barley water and half a pint of milk to be given with a spoon on the right side of the mouth. He was

also given Lotio Pot. Permang. iced, and told to frequently wash his mouth out with this. All day he was quiet and rather drowsy. His temperature at 6 p.m. was 98·0°.

10th.—Did not sleep well last night. This morning his temperature is 101·0°, respiration 20, pulse 80, fairly strong. Though his temperature is a little raised his condition is most satisfactory. He takes his food well; his expectoration is slight, and there is hardly any fœtor about his breath. In the afternoon the harelip pin was removed from the cheek, the flaps being in excellent (32) apposition. The patient now feeds himself, and needs no tube to the feeding cup. He is provided with a slate, and prevented as far as possible from talking. Evening temperature 100·8°. Morph. gr. ¼ 9 p.m.

11th.—Temperature this morning 98·8°, respiration 22, easy and regular. Air entering well at bases. No moist sounds (33). Is made to sit well up in bed, propped up with pillows. There is no induration or reddening (34) of any of the skin in the neighbourhood of the jaw or cheek. To-day he complains of more expectoration (35) of a viscid character. The wound is posteriorly covered with a little slough. A slight trace of fœtor, on which account the floor of the wound was painted with an ethereal solution (36) of iodoform. He was allowed to get up after tea. He complains of some nausea, disliking the milk and barley water, and preferring tea (38). This wish Mr. Jacobson acceded to, for the astringent matter in the tea appears to diminish his expectoration. Evening temperature 98·2°, respiration 22, pulse 74.

12th.—Improvement continues. No fœtor about mouth. Temperature normal. Up and about the ward in the afternoon; very little pain.

13th.—Temperature slightly subnormal. Alternate stitches removed from the cheek; excellent primary union. The dry cake of collodion and iodoform removed and fresh applied. Complains of sleeplessness at night, so Morph. gr. ¼ 9 p.m.

14th.—Temperature still slightly subnormal.

15th.—Most of the slough (39) on the floor of the mouth and on the cut surfaces of the tongue has come away leaving a healthy granulating surface. There is entire absence (40) of fœtor. Temperature normal, respiration 20, pulse 70. Diet

unaltered. Complained in the evening of pain in the (41) left ear and about the left side of the head, like that he had on admission; this he had been free from since the operation. Temperature 99·2° at 9 p.m.

16th.—About midnight hæmorrhage (42) began in the floor of the mouth; the nurse supposes that he lost about half a pint of blood. The ex-dresser was sent for and temporarily arrested it with matico; there was, however, a continuous oozing all the remainder of the night, and his expectoration was continually blood stained. This morning his temperature is 97·6°. It was discovered that the patient had yesterday surreptitiously acquired a biscuit from some other patient; this he had begun to eat in the course of the night, and this had started the hæmorrhage. The floor of the mouth was painted several times in the course of the day with collodion and iodoform, and all hæmorrhage ceased. He was given also ice to suck. Evening temperature 97·8°.

17th.—His temperature this morning is normal, but his pulse is between 120 and 130 with occasional intermissions. Respiration still easy and about twenty-two per minute. No moist sounds in lungs, and good entry of air at bases. He is in a depressed frame of mind, and refuses his food. Since 5 p.m. yesterday he has only taken half a pint of tea. There has been no recurrence of the hæmorrhage. The wounded parts are covered with feeble granulations. In the centre of the wound on the floor is a small piece of slough. Mr. Jacobson saw the patient this afternoon and directed that he should be fed with enemata (43) only for the present, and should be allowed nothing by mouth except ice to suck. On examining the mouth Mr. Jacobson detected the source of hæmorrhage, viz. a small chink about the centre of the floor of the wound. Since the margins of the chink show healthy granulations nothing was done to it. Evening temperature 99·6°, pulse 110.

18th.—Temperature slightly subnormal. When Mr. Jacobson saw the patient in the afternoon he removed with dressing forceps a small slough that was in connection with the above-mentioned fissure. It was about the size of half a pea, black and fetid. On washing it out it was found to contain the gut-ligature (44) that had been applied to the bleeding point in the

floor of the mouth towards the end of the operation. Enemata discontinued.

20th.—Temperature still slightly subnormal. Pulse 86. Pain in left ear and side of head less. There is no slough anywhere about the wound, and all is covered with healthy granulations. Patient up after dinner to-day. Since the enemata were discontinued he has been on an entirely fluid diet—milk, beef-tea, and brandy and egg occasionally. To-day he was put on farinaceous diet.

24th.—Temperature still slightly subnormal. Pulse 86, fairly strong, and no intermittence to be detected. Up all day, and on fish diet. He finds no difficulty in swallowing. All his excessive salivation has disappeared. The mucous membrane is beginning to extend over the granulations, and the cavity of the wound is contracting.

26th.—The gland below the left angle of the jaw, that was abnormally distinct three weeks ago, is not to be felt now (45), nor can anything resembling an enlarged gland be felt in the submaxillary region, or in the anterior triangle of the neck on either side. If the thumb be placed over the submaxillary triangle while the forefinger is placed on the granulating floor of the mouth, no indurated spot can be felt, though the intervening tissues as a whole feel rather firm.

27th.—To-day patient was discharged, having promised (46) to report in the course of a fortnight on his condition, and to return promptly if he has any reason to think that there is a recurrence of the disease. As regards his condition, in general health he is as well as when he entered the hospital, his mouth is no longer a source of constant pain, and he only finds it tender while eating. He does not suffer from the fœtor causing nausea which troubled him on admission, and he has lost all pain in the auriculo-temporal region. His speech is still very indistinct but quite intelligible. His pulse is regular, and fairly strong, and his lungs seem quite sound. His temperature is slightly subnormal. Finally, there are at present no signs of local recurrence of the disease indicating inadequate removal.

Commentary.

[With the view of comparing the case above reported with others, I have examined all the similar cases in the surgical reports of this hospital occurring between 1883 and 1887 inclusive. These I have tabulated on the same system as that adopted by Mr. Barker in his monograph in 'Holmes' System of Surgery.' They amount to seventy-six cases, and will be alluded to as 'G. H. R.' The tabulated cases are appended. The numbers refer to those occurring in the foregoing report.]

(1) Cancer of the tongue occurs with far greater frequency in males than in females. On consulting various statistics on the subject we find that over four males are affected to one female.

Mr. Bryant, 'Guy's Hosp. Reports,' vol. xli.	Mr. Barker, 'Holmes' System.'	Mr. Butlin, 'Diseases of Tongue.'	Mr. Clarke, 'Diseases of Tongue.'	Sir T. Paget, quoted by Clarke.	'G. H. R.' (*Vide supra.*)	Total.
M. . . 80	247	6	28	19	67	447
F. . . 22	46	1	11	11	9	100

To account for this Butlin is on the whole inclined to believe that it depends on the different habits of the sexes, males being more exposed to local irritation in the form of tobacco and raw spirits; it is moreover a fact that men are more liable than women to various forms of superficial glossitis.

(2) *Age.*—All writers are agreed that cancer of the tongue below the age of thirty is most rare. Butlin would appear to think that liability to the disease almost increases with age from thirty onwards, and suggests that the ordinary method of striking an average of a given number of cases is fallacious, since there are fewer persons surviving at the more advanced ages on whom the disease may fall. On examining statistics, &c., I find:

Mr. Bryant (loc. cit.) puts the average age between . 51—60
Mr. Barker ('Holmes' System') . . . . . 45—55
Mr. Butlin (loc. cit.) . . . . . 50—55
Average of 76 cases ('G. H. R.'): males 54½, females 46.

(3) *Heredity* appears to play no important part in the ætiology

of cancer of the tongue. As Butlin says, "If the theory of the inheritance of cancer rested on the family histories of persons with carcinoma of the tongue, it would soon cease to be accepted." Von Winniwarter states that "inheritance is excluded from almost all his cases." Barker in sixty cases finds only one positive case; finds it distinctly negative in twenty-two, doubtful in four, unmentioned in the remainder. Out of sixty-one cases of Morris's there are only two distinct cases, and five doubtful ones.

'*G. H. R.*'—Out of seventy-six, cancer is mentioned in twenty-two cases. In ten of these it is distinctly negatived. Analysing the remaining twelve we find:

No. of case.	Relative.	Form of cancer.	Alternative ætiological data.
(54)	Mother	Cancer of uterus	A smoker.
(59)	„	„ „	Irritation by teeth.
(42)	„	„ „	——
(3)	„	„ breast	Syphilis.
(14)	„	„ „	——
(38)	„	„ „ ?	Irritation by teeth.
(34)	„	„ „	A smoker.
(27)	Father	„ tongue	——
(26)	Uncle	„ „	A smoker.
(50)	Brother	„ liver	Mercurial glossitis and irritation by teeth.
(45)	Sister	„ cheek?	A smoker.
(17)	Uncle	„ ——	Irritation by teeth.
12			

(4) "In so far as syphilis is capable of producing ulcers and scars on the tongue, so far is it capable of predisposing the tongue to the occurrence of carcinoma; but the ulcers and scars produced by syphilis are not more prone to become cancerous than the ulcers or scars that are due to any other cause, nor is the psoriasis (leucoma) or chronic superficial inflammation produced by syphilis more apt to become cancerous than a psoriasis or chronic superficial glossitis which has had no connection with syphilis" (Butlin).

On the other hand, there is nothing in a syphilitic lesion of the tongue that will preserve it from taking on a cancerous character. "A tongue which has been the seat of syphilitic disease frequently becomes the subject of cancer. The altered

nutrition brought about by the irritation of the one affection encourages the development of epitheliomatous disease" (Bryant). Barker also negatives the assumption that syphilis predisposes to epithelioma. On examining statistics we find:

Statistics.	Case.	Syphilised.	Doubtful.	Certainly not syphilised.	The fact not recorded.
Von Winniwarter . .	46	3	4 had con	specific sor stitutional	es, but no symptoms.
Barker	60	12	3	22	24
Morris	61	13	1	9	38
'G. H. R.'	76	13	9	16	38

Barker goes on to say that instances are occasionally met with where an ulcer caused by the breaking down of a gumma has gradually developed an unmistakable epitheliomatous character, and I think Case 52 of 'G. H. R.' was probably an instance.

(5) Both Barker and Butlin speak most strongly against the use of caustics for sores on the tongue, most especially in simple indolent sores in persons over thirty years of age. Hutchinson speaks of caustics as "breeding cancers." Examining Barker's tables and the 'G. H. R.' cases, we may tabulate the result thus:

Tables.	Case.	Sex and age on admission.	Date of cauterisation.	Immediate result.
Barker's	23	F. 58	6 wks. before admission	"Ulceration soon afterwards."
	24	M. 58	18 months „ „	A "lump" converted into an "open sore."
	43	F. 26	9 „ „ „	"The ulcer continued."
	45	F. 31	3 years „ „	"The wound converted into a fast growing ulcer."
	49	M. 49	7 months „ „	A "pimple" cauterised four times, an ulcer on admission.
'G.H.R.'	7	M. 65	10 years „ „	Cured in ten months.
	29	M. 59	20 „ „ „	White spots relieved.
	35	M. 57	6 months „ „	Wart converted into a spreading sore.
	36	M. 55	22 years „ „	Affection lasted six or seven years.
	44	M. 64	2 months „ „	An ulcer on admission.
	56	F. 21	3 „ „ „	No relief.
	57	The case re	ported above.	
	58	M. 64	4 months „ „	No benefit, continued to spread
	62	M. 50	4 „ „ „	No benefit, ulcerated on admission.
	70	M. 52	6 „ „ „	No benefit.

(6) *Relation of smoking to cancer of the tongue.*—On this subject Butlin says: "There is no evidence with which I am acquainted which will prove that carcinoma is really much more common among adult males who smoke than among adult males who do not smoke; yet I think it is not improbable that smoking does to a certain extent predispose to the disease." He puts it on the same footing as syphilis; both may cause forms of chronic glossitis, which may afterwards light up into epithelioma. Bryant appears to look on smoking rather as the exciting than as the predisposing cause, saying that "it (cancer) in the majority of cases is excited by some local irritation, such as . . . a hot pipe" (Bryant, loc. cit.). Barker lays more stress on the ætiological importance of smoking, but he, like Butlin, looks on it rather as bringing about a predisposing condition, which "on the addition of a slight external irritant will commence to undergo epitheliomatous change."

Statistics.	Male cases.	Smokers.	Non-smokers.	Cases in which alternative ætiological data are given.	Cases in which no other ætiological data are given.
Barker's .	55	32	3	14	18
'G. H. R.'	67	31	1	17	14

Taking these facts together we find that out of 122 male cases there are thirty-two cases in which smoking is the only suggested cause. It now remains to be seen whether we can determine whether smoking acts as a predisposing or an exciting cause.

In favour of its being an exciting cause we can point to four cases in which the ulceration is situated at a spot that had been made sore by the pipe, and four more in which the tongue was actually wounded by the pipe.

On the other hand, if we glance over the cases in which smoking is one of the ætiological data, we find that there is a history of soreness about the tongue of an average duration of seven months; and it is a practical impossibility, with our insufficient data, to decide on the significance of this fact. If the period had been twice as long we should have been justified in saying that smoking probably was not the exciting cause;

whereas had the period been only two or three months, we might fairly have assumed it not to be a predisposing cause. Without more accurate data as to the state of the surrounding lingual epithelium the question must remain an open one.

In the case before us, however, we doubtless have a case of non-malignant mischief set up by smoking, or syphilis, or both, which some forty years later takes on a malignant character.

(7) The result of this antisyphilitic treatment conclusively proves that syphilis was at the bottom of his complaint, and that, if his dates be correct, he was at that time suffering from some tertiary manifestations of the disease, aggravated, according to his own feelings, by smoking. With no clear account of the character and appearances of the lesion, it would be idle to speculate on the form in which his syphilis was manifesting itself.

(8) The patient tells us that he noticed no symptoms of his present disease till seven months before admission. Here again we are dependent on the patient's intelligence for our information, and unless he be carefully interrogated we have no means of distinguishing between an acute attack and the supervention of an acute phase on a chronic lesion. Even farther, the patient may quite unintentionally deceive one, so often are they unaware of the existence of a chronic lesion (*e. g.* leucoma) until it is pointed out to them.

Barker, in the first column of his tables, has endeavoured to collect the data as to the first appearance of the disease, and I have followed him in tabulating the cases from the 'Guy's Surgical Reports.'

On collecting and analysing the answers to the question, "When was the first evidence of the disease noticed?" it will be found that in about two thirds of the cases the history is of less duration than twelve months, and in about half the cases of less than six months. Of the remaining one third it will be found that the majority are over five years' duration. This latter fact merely shows that the patient recognised some precancerous disease, and in many cases it will be found that the date of the supervention of the acute attack is also given.

(9) *A small pimple.*—Barker lays considerable stress on the importance of familiarity with the several initial forms of lingual cancer, meaning fissures, pimples, blisters, &c., but

Butlin more justly remarks that "it is not so important to remember the number of instances in which carcinoma has first appeared in each one of these forms, as it is to bear in mind that each one of these forms of disease is capable of becoming carcinomatous. But the great interest in relation to them is to study carefully the manner in which each of these become carcinomatous, and, above all, to strive to arrive by the most careful study at the signs by which the actual development of carcinoma in each of them may be perceived."

This can only be done by long and careful "out-patient" observation, the transitional period being generally only too long past when the patient is admitted to a hospital ward. Consequently it is of little use to analyse statistics on such a question.

There is, however, another aspect in which the nature of the initial lesion may be viewed. If we can determine from its characters its cause, *e. g.* that it is syphilitic, or that it is due to local irritation; and if we have good reason to suppose that it is not yet cancerous, we derive a distinct advantage, for we can direct our treatment against this breeding ground for cancer.

With this idea in view, if we glance over such tables as those of Barker and those from the 'G. H. R.' we find that the great majority of those described as "sores" are due to local irritation; that in most cases of those called "ulcers" there is a syphilitic history; that "blisters" are often mentioned by confirmed smokers as the initial lesion in their case; while in only one eighth of the cases commencing as pimples is there a syphilitic history, whereas "lumps" in or on the tongue and "swelling" of the tongue generally prove to be gummatous. It is needless to point out how much allowance must be made for vague phraseology in such questions.

(10) *The left side of the tongue.*—The statistics of von Winniwarter, Woelfler, Barker, Morris, Butlin and the 'G. H. R.,' all prove conclusively the far greater frequency of cancer on the sides of the tongue than elsewhere. Nothing points more markedly to the fact that the immediate cause of cancer is probably some irritation *ab extra*.

(11) Rough or jagged teeth are frequent causes of fissures on the side of the tongue, which fissures Butlin describes as

usually not very long, but sometimes both deep and starred, and often discharging foul matter. Usually there is inflammation around these dental fissures, and the base is slightly raised and indurated, or it may be swollen and sodden. The sides and bottom of the fissures are ulcerated; "indeed the condition may more correctly be described as a fissured ulcer than as an ulcerated fissure."

Butlin also points out that the continuous irritation of a tooth may give rise to a nodular swelling which does not always ulcerate. With reference, however, to the present subject, the important feature of dental irritation is the liability of its acting as an exciting cause of cancer. Nothing appears to be more common in the history of lingual cancer than to find it originating in some indolent ulcer which is irritated by some tooth.

In fourteen of Barker's cases and in twenty-one of the 'G. H. R.' cases teeth are mentioned as one of the ætiological data of lingual cancer, and in fourteen of these thirty-five cases is no other cause suggested.

In these cases attributed to dental irritation alone we must suppose it to have been of long standing and to have acted both as predisposing and exciting causes. It is interesting to note that in one case (No. 46 of Barker's) the cancer originated in wounds caused by biting the tongue in epileptic fits.

(12) *Absence of cachexia* is frequently noted in reports on the condition of the patient when admitted for lingual cancer. The patients are often said to have lost weight through deficiency of food owing to the pain of mastication and deglutition, but the true cancerous cachectic appearance is seldom found. The probable explanation lies in the rarity of any wide dissemination of this form of cancer. For some reason imperfectly understood, cancer of the tongue appears to advance rapidly as far as the glands of the neck and then remains more or less stationary, only extending by continuity for a comparatively long period. Out of the 136 cases (Barker's and 'G. H. R.') we can collect thirty fatal cases. Unfortunately the post-mortem reports are incomplete, but only in three do we find specific mention of secondary deposits in the internal viscera (viz. No. 48 Barker, Nos. 24, 37 'G. H. R.'). In two other of Barker's cases the cause of death is styled can-

cerous marasmus (Nos. 47, 58), and in one of the Guy's Hospital Surgical Reports death resulted from "exhaustion" without operation.

The data are meagre, but they tend to prove lingual cancer an essentially local disease in its earlier stages.

(13) *The cancerous ulcer.*—The description of the ulcer in the case reported is that of a typical ulcerated cancer of the tongue, and in the large majority of cases these cancerous growths are ulcerated. Butlin believes that "the only cases in which ulceration is absent for some long time after the disease is thoroughly developed are those in which it commences as a warty growth; when this is papillary and rather dry and hard it may remain long unbroken, and the carcinoma may develop in the substance of the tongue. The lump or nodule underneath the surface is also not ulcerated at first, and may develop to a considerable size before it breaks down, but it seldom remains unbroken for more than a few weeks."

(14) *Pain in the ear.*—This reflected or referred pain in the auriculo-temporal area will be found to be very common. It appears to occur more often in those cases in which the ulceration involves the posterior third of the tongue. The existence of pain is not noted with sufficient regularity in the reports to make any collation of its occurrence in this region of any value. I might add that I have seen two patients come to the *aural* department complaining of pain in the ear, which has proved due to lingual cancer.

(15) *A leucomatous patch.*— Interesting as any statistics would be on this subject, it is impossible to compile them from examination of old reports. Even granting the existence of such a lesion of the mucous membrane is noted, we find that very rarely is any history of its first appearance obtainable, the patient knowing nothing of it.

Leucoma (leukoplakia, psoriasis linguæ, plaques opalines) is one form assumed by the mucous membrane in disease. It is a form of chronic superficial glossitis in which the superficial horny layer of cells becomes modified in such a manner that the characteristic pearly tint is presented to the eye, while the atrophy of the papillæ gives it its smooth glistening character. This chronic inflammation of the mucous membrane may take other forms, *e. g.* that of a glossy red patch; here the histo-

logical appearances are the same, but for some imperfectly understood reason the optical characters of the superficial cells are different, and the pearly tint is wanting. Leucoma is seen in its most simple form in a "smoker's patch," and in an aberrant form in ichthyosis (Hulke, 'Clin. Soc. Trans.,' 1868) in which the papillæ are hypertrophied. Space does not permit of a fuller discussion of this affection. It need only be added that in the case before us we have two of the known causes of leucoma in operation, viz. excessive smoking and syphilis, and in the existence of leucoma we have a predisposing cause of lingual cancer (*cf.* also Goodhart on "Cancer illustrated in Ichthyosis," 'Guy's Hospital Reports,' 1875; *cf.* also Butlin on "Smooth Tongue," 'Med.-Chir. Trans.,' vol. lxi).

(16) The mobility of a cancerous tongue is a matter of considerable diagnostic interest, or rather prognostic interest, nothing giving a clearer indication of the extent to which the extrinsic muscles of the tongue are involved in the disease.

(17) The enlarged glands in this disease are of no less clinical interest than the visible cancer.

In all cases of lingual cancer the glands sooner or later are infiltrated. The group affected depends on the part of the tongue that is affected, and in cases where we have ulceration on one side of the tongue and enlarged or indurated glands on the other side of the neck, we may fairly assume that the primary disease has transgressed the middle line. In the earlier stages of their affection the glands are small, hard, and freely movable; but they gradually become softer, larger, and more firmly adherent to neighbouring structures. In later stages they frequently caseate or suppurate.

Obviously the date at which the glands become affected is an important question, but it is impossible to fix this date accurately. Much depends on the character of the cancer, the glands becoming infiltrated much earlier in deeply ulcerated cases than in cases in which the cancer is papillomatous, or even fairly shallow.

On examining the two statistical tables which have been so frequently referred to, we find that the glands may be unaffected in cases with a history of three years' lingual affection, while, on the other hand, they may be found affected in cases where the primary lesion is of less than two months' standing.

Again, we find cases reported in which it is distinctly stated that no enlarged glands can be detected before operation; yet the patient returns shortly after operation with recurrence of the disease in his neck.

The safe rule of practice would therefore appear to be to remove any enlarged or hardened glands that are freely movable, if we have good reason to suppose that they are all that are affected. Whether this be made a preliminary or a subsequent operation, or whether it be done at the same time that the tongue is operated on, must depend on circumstances. It only remains to be noted that if the local disease be removed in the mouth, but these secondary deposits in the glands are left untouched, these glands generally become the mechanical cause of death.

(18) *Diagnosis.*—In this case the diagnosis was easy; the age and sex of the patient were in favour of cancer. The appearances of the sore itself were typical; it position was typical; its history was typical. In fact those affections that sometimes closely simulate cancer, such as gummatous and tubercular ulcers, were quite out of court, and the existence of an enlarged gland clenched, as it were, the diagnosis.

Butlin's method of diagnosing by means of microscopic examination of scrapings was not employed, but the writer can remember the readiness with which the typical appearances of the cells of squamous epithelioma were to be recognised in scrapings taken from such an ulcer on the glans penis.

(19) For all practical purposes there is only one form of cancer of the tongue, viz. squamous epithelioma. This is strange when we consider how rich the hinder part at all events of the tongue is in mucous glands and such structures containing gland-epithelium. Nevertheless, as a fact, spheroidal epitheliomata (=carcinomata), whether scirrhus or encephaloid, are practically unknown. Like other squamous epitheliomata, epithelioma of the tongue may commence as an elevated growth before it eats its way into the tissues.

(20) When a case of cancer of the tongue presents itself, the question of treatment resolves itself into this: Can the disease be arrested or delayed by operation or otherwise? or, on the other hand, must we content ourselves with palliative treatment?

In the first place it is undoubtedly possible to actually cure the disease by operative treatment if it be taken in time, thanks to its local nature; and even failing this, statistics go to prove that life may be prolonged for some months and made more bearable even if the disease be not extirpated, and the eventual form of death is less terrible.

On the other hand, the risk attendant on all operations is to be borne in mind, and if we are not going to extirpate the disease, we have less severe means of alleviating distress than by operation proper, *i. e.* excision, for division of the lingual gustatory nerve, as practised by Hilton, is an operation devoid of risk and severity, and the relief, for a time at all events, is immense. The other palliative measures, such as cutting off the blood supply of the growth by ligature of the lingual artery or arteries, and the local application of drugs, are not attended with much success.

In the case before us we have a comparatively healthy man with a tolerably localised disease and only one gland that may be affected, as far as can be judged by the fingers. He is in constant pain; his disease is daily getting a firmer footing, and every day diminishes the chance of doing any good.

An operation being decided on with a view of removing the diseased parts, we have the choice of several methods. The free mobility of his tongue proves that the extrinsic muscles are not much if at all affected, so what is required is a free removal of the middle third of the left side.

Leaving out of question the inframaxillary operations needed where the floor of the mouth is extensively implicated, we may compare the various methods of operating suitable in such a case as this, where the diseased parts can certainly be removed from the mouth by the mouth, and we must also omit discussion of such operations as Billroth's, where there are neck wounds for the ligature of the lingual arteries and the removal of glands.

Assuming, then, that we only aim at freely removing the ulcerated growth occupying the middle third of the left side of the tongue, we may class the operations open to us as those by crushing, those by burning, and those by cutting. The older method of merely ligaturing the growth and allowing it to slough may be omitted.

(i) As regards crushing operations (*i. e.* by using a wire or whip-cord écraseur), the supposed advantages are the prevention of hæmorrhage and the occlusion of the lymphatic canals, thus diminishing the risks of septic absorption.

Against these supposed advantages are to be set (1) the extensive bruising of the parts; (2) the liability of the loop to slip forwards and not fairly remove the diseased part; (3) the risk of the wire or cord breaking and giving rise to most troublesome hæmorrhage; and finally (4) it will often be found that even after the écraseur is screwed home the artery and nerve remain in the loop half crushed, and are either dragged forwards on attempting to remove the instrument, or else hæmorrhage ensues on relaxing it.

In Barker's statistics eleven cases of its use are reported, and in seven of these its action was satisfactory as far as avoidance of hæmorrhage and apparently free removal is concerned; but in three it failed to remove the growth adequately, and in one case there is stated to have been profuse hæmorrhage. In the 'G. H. R.' we find four cases treated by the whip-cord écraseur; of these three were satisfactory, but in one the écraseur broke and a considerable amount of blood was lost.

The other advantage claimed for crushing operations, viz. that the lymphatics are occluded, hardly merits notice.

(ii) Turning next to operations of removal of the growth by burning, we have the thermo-cautery and the galvanic écraseur. The former is hardly ever used except as an auxiliary to some other method, but the use of the galvanic écraseur has been extensive.

It will be seen by the subjoined analysis of the cases in which it was employed in Barker's statistics and in this hospital from 1883 to 1887, that we have twenty-six cases of its use on which to base our observations. We see that out of twenty-six cases nine proved fatal (*i. e.* 34 per cent.); that in seven cases there was hæmorrhage during the operation, due either to failure of the apparatus or to the inability of the heated wire to occlude the vessels; that in eight cases the amount of subsequent fœtor was sufficient to call for notice; that in several cases the sloughing was considerable and prolonged; that in eight cases there was secondary hæmorrhage;

Twenty-six Consecutive Cases of Operation with Galvanic Écraseur.

	No.	Hæmorrhage at time of operation.	Subsequent fœtor.	Sloughing.	After complications.	Immediate result.	Date and cause of death.
Barker's	4	"None"	"Much"	...	...	Relieved	...
	5	"Considerable"	...	...	Bronchitis on 5th day, followed by pneumonia and pleurisy	D.	7th day. Pulmonary mischief, not pyæmic.
	6	...	...	...	Hæmorrhage on 7th day	Good recovery	...
	7	Écraseur failed and recourse had to scissors, much hæmorrh.	...	...	Bad cough, trace of pneumonia, pains rheumatic? in right knee and ankle	Relieved: apparent recurrence in cicatrix	...
	11	...	"Much"	...	...	Relieved: but inefficient removal, "wire passing through growth"	...
	12	...	...	...	Hæmorrhage from stump 10 to 13 days.	Relieved	...
	13	...	"Great"	...	...	Relieved, but "wire-loop passed through diseased tissue, leaving some behind"	...
	15	...	...	...	Cellulitis of neck, 4th day	D.	9th day. Œdema glottidis, exhaustion, cellulitis of neck.
*	17	"Not much"	...	...	7th day bronchitis, 11th day pleurisy	D.	14th day. Bronchitis, pleurisy, and pneumonia.
*	18	...	...	...	5th day bronchitis	D.	8th day. Pleurisy, pneumonia, and abscesses of right lung. These abscesses not pyæmic.
*	19	...	"Great"	...	Good recovery	Relieved	...
	20	...	...	...	4th day symptoms of septicæmia	D.	Septicæmia, lungs congested, no abscesses.
	21	...	...	...	Very good	Recovery	...
	22	Profuse, necesitating laryngotomy	...	...	Rapid respiration next day	D.	2nd day. Gangrene of lung with abscesses, much blood had entered air passages.
	23	...	"Great"	...	11th day profuse hæmorrhage from stump	Relieved, but a question of local recurrence	...

	27	...	...	...	2nd day cough, 5th day hæmorrhage.	Relieved, but rapid recurrence. Galv. écr. had failed to remove all of growth, and scissors had to be employed afterwards	...
	32	...	...	...	Cough began on 2nd day and lasted till death	D.	Double bronchopneumonia with grey hepatisation of right base. Galv. écr. had not removed all of growth, scissors had to be employed also.
'G. H. R.'	14	...	"Great"	Not clear by 17th day	...	Discharged, "perfectly well." Section found to pass very near growth	...
	17	...	Discharge not very foul	Not clear by 15th day	...	Relieved, but removal of growth not complete	...
	25	Obstinate owing to breaking of écraseur.	...	...	...	Relieved	...
	29	One vessel needed torsion	"Some," a few days later "much"	Clear by 7th day	6th day some hæmorrhage and some pulmonary symptoms	Relieved	...
	36	"None"	"Great"	...	5th day hæmorrhage, 6th day ditto, 8th day ditto	D.	9th day. Pulmonary.
	47	Wire first broke, then battery found insufficient. Eventually finished with scissors.	...	...	...	Relieved	The line the écraseur would have taken would have been through posterior end of growth. The scissors passed one and a half inches farther back.
	61	"Some"	"Some"	Much, not separated by 12th day.	...	Relieved	Registrar reports that the cautery went through, or at all events very close to the ulcer.
	73	...	...	...	11th day hæmorrhage, 12th day ditto	Discharged	Died six days later of hæmorrhage. Incomplete removal.

* In No. 18 (Barker's cases) the jaw was divided). In Nos. 17, 19, 24, the symphysis was divided.

that in ten cases there were symptoms of pulmonary mischief (seven of which were fatal); that in ten cases the removal of the disease by the écraseur was, or would have been, incomplete, or at all events not as free as could be wished. Other objections to the galvanic cautery are its expensiveness and cumbersomeness, and moreover it so chars the tissues that it is hard to determine whether the removal be free enough by any examination of the surfaces of the section.

(iii) Lastly, there is the operation for cutting it out with scissors and arresting the hæmorrhage as the vessels are successively divided, which method of operation has been worked out by Whitehead.

In his pamphlet on 'Excision of the Tongue' (Churchill, 1881), Whitehead fully discusses the minutiæ of the operation, and it is also advocated by Lund, of Manchester, in an essay read before the Medical Society of Owens College (May, 1880).

This was the operation performed by Mr. Jacobson in the case reported, and, except for a few minor modifications which will be noted, Whitehead's directions were strictly adhered to.

Any attempt to collect cases of Whitehead's operation is very difficult, for often the operations run far beyond the scope of his description. We find many cases of excision of the tongue by scissors alone, but many of them are complicated with operations for glands, and with previous ligature of the lingual artery, or with preliminary tracheotomy. Take, for instance, No. 50 'G. H. R.' Here the fatal issue is due to the tracheotomy wound, and it would be obviously unfair to attribute this to the principle of the main operation.

Omitting, then, such cases as this, I think we may fairly class as Whitehead's operations two from Barker's cases (viz. 25, 35), and forty-one from the 'G. H. R.'[1] Out of these forty-two cases we find that eight were fatal, and thirty-five recovered, which figures contrast favorably with those of excision by the galvanic écraseur.

Space does not permit of discussion of Kocher's antiseptic method, nor, in short, of all the various operations needed or applicable in cases differing from the one reported.

[1] Viz. 3, 5, 8, (9), (10), 11, 13, 18, 19, 20, 23, 26, 27, 28, 33, 34, 35, (39), 40, 41, 42, (43), (44), 46, 48, 49, (51), 52, 53, 54, 55, 56, 57, 58, 66, 68 (69), 70, 74, 75, 76. Those marked with brackets being of doubtful admissibility.

(21) Chloroform is the preferable anæsthetic in such cases as this since it can be administered with least inconvenience to the operator, and, moreover, permits of the use of the thermo-cautery if required.

(22) The head of the patient must be raised as far as possible, *i. e.* as far as is compatible with the safe administration of the anæsthetic, in order to facilitate the swabbing out of the blood.

(23) *Division of the cheek* gives far more room for operation, more command over the instruments, and more light. In a case like this, where the posterior third of the tongue has to be operated on, its advantages are immense, for it must be remembered the tongue does not come well forward till the stylo-glossus and the palato-glossus are divided.

Of course, the step has its disadvantages, viz. it leaves a scar (though this need not be visible in a male patient), and it is attended with that amount of risk that accompanies all operations of however minor importance. In Barker's cases I find only one case in which the cheek was divided, and here the recovery of the patient was delayed by swelling of the side of the face and abscesses in the eyelids, while in the 'G. H. R.' I find twelve cases (including the one reported), in one of which there was an attack of erysipelas.

(24) Mr. Whitehead and Mr. Jacobson in his commentary on Whitehead's operation ('Lancet,' 1883), both insist on the importance of turning the head well to the side that is being operated on, in order to allow the blood to collect in the buccal pouch of that side, whence it can easily be scooped out with sponges.

(25) This *longitudinal division* of the tongue, when only one side is to be removed, may be done either with the scalpel, with scissors, or by tearing it after dividing the cortex with scissors as described by Morrant Baker ('Brit. Med. Journ.,' 1883, ii, 765).

Even when the whole tongue is to be removed it is often found of advantage to bisect it first and remove each half separately.

(26) That the operator, and not the assistant, should hold the suture is a modification of Whitehead's method suggested by Mr. Jacobson (loc. cit.), who contends that the operator can better draw the part in any direction required.

(27) The cortex of the tongue is a suitable term for the tough outer layer of that organ. "Examined in transverse section the muscular fibres are seen to be arranged so as to render the substance divisible into an outer part or cortex, and an internal or medullary part" ('Quain's Anatomy,' ninth edition, vol. ii, p. 572).

The importance of this surgically lies in the greater toughness of the cortex. It cannot be readily torn with a blunt instrument as can the medullary part.

(28) On anatomical consideration it is obvious that division of the fibres of the anterior pillar and perhaps also of the hyoglossus will allow this freedom of protrusion of the tongue.

(29) This division of the medullary tissue of the tongue with a blunt instrument, thus exposing the lingual artery in its continuity, I do not find mentioned in any publication on the subject. Mr. Jacobson appears to have been the first surgeon to do this (*cf.* Cases 41, 42, 55, 58 'G. H. R.'). Its advantages are obvious.

(30) Hæmorrhage from the floor of the mouth appears to be a frequent source of trouble. It is rarely of a pulsating character, but appears rather capillary or even venous. It is mentioned in several reports as obstinate.

(31) The diet of the patient after excision of the tongue must vary with the circumstances of each individual case. Theoretically, no food should be allowed to pass over the wound, but this reduces us to two alternatives: either the patient must be fed by nutrient enemata or by an œsophageal tube.

The objection to the first of these courses is that the bowel is likely soon to refuse to retain the enemata, while to the latter a still more serious objection may be raised. Either the tube must be frequently passed, to the patient's great disturbance, or else the patient has his œsophagus permanently blocked at a time when his mouth is full of secretions most poisonous to the lungs, all of which he must either spit out, or allow them access to his air passages. To have his œsophagus blocked during his sleeping hours seems to be setting a premium on septic pulmonary mischief. When the whole tongue has been excised we are therefore on the horns of a dilemma, but when there is half of the mouth still sound, as in the present

case, the lesser evil appears to be to adopt the method of feeding that that was used in this case.

(32) *Cf.* note 23, *supra*. In only one case do I find any report of delayed union after division of the cheek (Case 68).

(33) The importance of recognising any pulmonary mischief at as early a date as possible is obvious when one looks over the cases that have proved fatal after operation. Out of ninety-nine cases operated on (Barker's cases and those collected from 'G. H. R.') twenty-three proved fatal, and of these fatal ones eighteen showed pulmonary symptoms, and pulmonary mischief was found post mortem. Of those that recovered thirteen showed signs of pulmonary mischief at some period after the operation.

(34) Next to lung complications, diffuse inflammations and cellulitis are the effects of the operation most to be dreaded. These will be found more commonly in those cases where secondary operations have been done in the neck, and two have been already noted arising from the division of the cheek. One fatal case was found post mortem to be due to acute suppuration extending into the mediastinum from the wound for preliminary tracheotomy. Apart, however, from these secondary sources, cellulitis may develop if the tongue be removed deeply from the floor of the mouth, and the deeper areolar layers be invaded.

(35) Excessive viscid expectoration is a common source of annoyance to the patient after excision of the tongue, whether partial or total. The evils of an œsophageal tube have already been pointed out, for it is better that this septic material should be swallowed than that it should invade the air passages. When in addition to an œsophageal tube there is also a tube in the patient's trachea, and he is debarred from aiding the expulsion of these secretions by coughing, his condition is unenviable (*cf.* Cases 19, 20, 49 'G. H. R.').

(36) This is a convenient way of applying iodoform, only it is important first to dry the surface lightly with a camel-hair brush. It may also be applied in the form of a gauze pad saturated with the powder. The chief objection to iodoform lies in its nauseating effect, but nothing compares with it as a means for overcoming fœtor.

(38) I find no other allusion to this use of the astringent

qualities of tea; its effect in diminishing viscid expectoration would be well worth observing in these cases.

(39) Most of the slough had now come away seven days after the operation. An examination of the reports of cases in which the tongue was removed with scissors will show how much less sloughing is caused by this method than by those of crushing or burning.

(40) So, too, the fœtor is much less in these operations; notably less than in those cases in which there remains the charred stump after the use of the galvanic écraseur.

(41) The pain in the auriculo-temporal region appears often to persist after excision of the tongue, nor is this surprising in the earlier days, for if a painful ulcer can give rise to such referred pain there is no reason why a painful wound should not have the same effect. In one case (of Mr. Bryant's) in which the lingual gustatory nerve was divided as a palliative measure, the pain was alleviated only for a time, the proximal end of the nerve apparently being soon caught in the growth.

(42) This hæmorrhage can obviously not be fairly regarded as secondary, due to any fault in the operation, this being a very rare complication after excision with scissors. Out of the ninety-nine cases operated on recorded in Barker's statistics and those drawn up from the 'Guy's Reports,' we find more or less hæmorrhage occurring after the operation in seventeen cases as follows (in one case it proved fatal, Case 73):

Date of hæmorrhage.	Number of cases.	Nature of operations.
Evening of operation .	6	All cases of excision by scissors.
Day after operation .	1	Case „ „
4 days „ „	2	Cases „ „
5 „ „	1	Case of excision by galv. écraseur.
6 „ „	2	Cases „ „
7 „ „	2	Cases „ „
10 „ „	1	Case „ „
11 „ „	2	Cases „ „

(43) The enemata ordered were:

Liq. Pancreat. ʒj,
Yolk of an egg,
Brandy ʒj,
Sodæ Bicarb. gr. x,
Beef-tea ad ʒiij.

(44) On microscopical examination of the gut ligature, one end, where it was slightly frayed, was found to be infiltrated with what would appear to be leucocytes. This was ten days after it was applied. It stained well with hæmatoxylin, and has kept well in Canada balsam.

(45) The subsidence of this gland makes one hope that its previous enlargement was merely due to the inflamed condition of the tongue. When, however, one considers how much more often infiltrated glands are for a long time undetected, it is far more reasonable to fear recurrence in the neck.

(46) As is usual in hospital practice, patients are lost sight of as soon as they leave the ward. This patient has never been seen since his discharge, and letters addressed to him have been returned by the Dead Letter Office, this being apparently due to his peripatetic vocation.

The subjoined cases are collected from the Surgical Reports, and comprise all those of lingual carcinoma occurring between 1883 and 1887.

I have thought it best to include cases even though not operated on, since the reports on these cases often give evidence on other points of interest. The cases were originally tabulated on the same system as that adopted by Barker in 'Holmes' System,' but for simplicity in printing they are here given in plain type; it will be seen, however, that the various headings correspond to those used by Barker, and consequently these cases can be fairly compared with his in deducing any given point. We thus have 122 cases on which to base deductions.

Each case, it will be seen, is arranged under the following heads:

(*a*) Sex and age of patient. Name of surgeon.
(*b*) First evidence of disease; when and where noticed.
(*c*) Present state of primary disease; pain.
(*d*) Any glands enlarged, and where.
(*e*) Ætiological data: (1) heredity, (2) smoking, (3) syphilis, (4) local irritation, (5) leukoplakia, (6) indigestion, &c.
(*f*) Date and mode of operation.

(*g*) Course and after-treatment.
(*h*) Immediate result.
(*i*) Date and cause of death.
(*j*) Ultimate result.
(*k*) Remarks on the case.

1883—Case 1.

(*a*) Male, 54; under Mr. Bryant.

(*b*) Seven months ago detected an ulcer on his tongue; has been liable to ulcerated sore-throats since childhood, and for some years enlarged glands have come and gone in the neck, accompanied by colds and sore-throats.

(*c*) Epiglottis deep crimson and thickened; anterior aspect and L. lower half occupied by a ragged ulcer extending on to tongue and lower part of L. tonsil. R. side of base of tongue also indurated. Deglutition impaired.

(*d*) Many enlarged glands on either side as low as cricoid. Tissues between chin and hyoid brawny.

(*e*) No syphilis. Other facts not mentioned.

(*f*) None attempted.

(*k*) Some huskiness of voice. Expectoration purulent and blood streaked.

Case 2.

(*a*) Male, 40; Mr. Bryant.

(*b*) Nine months ago a pimple on L. border of tongue; this enlarged with a depressed centre and hard white border.

(*c*) An oblong exfoliating fleshy growth two inches long on L. border, deep pit in centre; whole projects half an inch from surface, slightly redder than rest of tongue, surface irregularly lobulated.

(*d*) Enlarged glands in L. submaxillary region.

(*e*) Sore on penis eighteen years ago. No constitutional symptoms observed.

(*f*) L. lingual gustatory nerve divided. Growth found to have infiltrated gums, floor, and fauces.

(*g*) Discharged five days later. No pain in growth, but persistent about jaw and left side of face.

(*h*) Great relief.

Case 3.

(*a*) Male, 37; Mr. Durham.

(*b*) Four months ago a pimple on L. border of dorsum. Tongue has gradually become swollen and thickened round this spot.

(*c*) An ulcer size of half-a-crown on posterior half of L. side. The anterior half of the tongue, chiefly on the R., is covered by a thick white coating of epithelium, fissured in several places. On dorsum at tip is a blood-red patch, the size of a sixpenny-bit.

(*d*) None detected on admission.

(*e*) Syphilitic sore twenty years ago. Mother died of cancer of the breast.

(*f*) Jan. 20th, whole tongue removed by Whitehead's method.

(*g*) An abscess formed near L. angle of jaw, but subsided under belladonna and glycerine. Discharged Feb. 9th. Re-admitted Feb. 26th, and had this abscess opened.

(*h*) Relieved.

(*j*) March 9th.—Speech very good. March 23rd.—Re-admitted for an abscess in front of R. sterno-mastoid. A recurrent ulcer on floor of mouth.

(*k*) On examination, the removed growth was seen to be a typical epithelioma, and, at the time, appeared to have been removed freely.

Case 4.

(*a*) Female, 58; Mr. Durham.

(*b*) Nine months ago a pimple on R. side of tongue.

(*c*) Indurated swelling from R. anterior pillar to within half an inch of tip; transversely from alveolus of R. jaw to beyond raphe. Pain over R. side of face.

(*d*) Enlarged near angle on both sides.

(*e*) Has bad teeth.

(*f*) No operation attempted, patient being too weak.

(*g*) Fed by nasal tube. Mouth washed with permanganate.

(*i*) Died about a month after admission of exhaustion.

Case 5.

(*a*) Male, 71; Mr. Durham.

(*b*) Recurrent growth after partial excision, four years previously (1878).

(*c*) L. side and floor now involved. R. side infiltrated.

(*d*) No enlarged glands on readmission (July, 1883).

(*f*) Preliminary laryngotomy. L. cheek divided, and whole tongue removed by Whitehead's method, July 24th.

(*g*) Four days of bronchitis shortly after the operation. Laryngeal tube removed on sixth day. Discharged Aug. 15th.

(*h*) Relieved.

(*j*) Readmitted again (Sept., 1883), and had three infected glands removed from L. submaxillary region.

Case 6.

(*a*) Male, 56; Mr. Howse.

Readmitted for recurrence of growth which had been operated on in 1882. Tongue "got bad again" four months after his discharge. Growth now reaches from first R. molar round the base of the tongue, across the floor of the mouth as far back on the L. side as can be felt. Tongue infiltrated. Beneath tongue a large fetid cavity. No hard glands under the jaw. Tissues under chin and L. jaw, brawny. No operation.

Case 7.

(*a*) Male, 65; Mr. Davies-Colley.

(*b*) Ten years ago had a sore on his tongue which was cauterised, and cured in ten months. No mention of commencement of present affection.

(*c*) Small elevated growth on R. of dorsum, extending from middle line almost to edge, and to three quarters of an inch from tip. Warty surface. R. edge hard. It fades away posteriorly, and is opposite a sharp tooth. Rest of tongue ichthyotic, and marked with old syphilitic scars. White patches on both anterior pillars, uvula also scarred.

(*e*) A great smoker. Syphilis forty-one years ago. Teeth bad.

(*f*) Refused operation.

Case 8.

(*a*) Male, 50; Mr. Davies-Colley.

(*b*) Five months ago tongue sore, attributed to teeth; had

them filed, but no relief. Then noticed an ulcerous crack on L. side. This presently healed, but left a hard nodule.

(*c*) A hard mass comprising the thickness of the tongue, extending across dorsum for nearly three quarters of whole surface; can be felt as a thickening in substance of organ with a rounded outline. An excavated ulcer at back of mass. R. side of tip movable, L. bound down. No discharge, but considerable fœtor. L. tonsil involved.

(*d*) An enlarged gland in L. submaxillary region.

(*e*) No syphilis. Irritation by teeth (*v. supra*).

(*f*) Feb. 20th.—Tongue removed by Whitehead's method (operation suspended temporarily owing to cessation of breathing due to some blood in trachea). Glands also removed from submaxillary region. L. tonsil removed.

(*g*) Nasal œsophageal tube, then enemata. From March 4th—10th some pyrexia, with swelling of uvula and soft palate. Discharged April 10th.

(*h*) Relieved.

(*j*) Readmitted Sept. 15th, 1884, and was in the hospital till Oct. 12th. The submaxillary gland (R.) was found to be involved, and the greater part of it was removed. A fluctuating swelling was left, apparently due to some occlusion of the duct. This soon subsided. Last seen March 27th, 1885, with recurrence and ulceration on L. side of mouth.

Case 9.

(*a*) Male, 58; Mr. Lucas.

(*b*) Five months ago the last molar on the L. cut and irritated his tongue. Had it extracted; no relief.

(*c*) A hard growth at back part of tongue, with distinct anterior margin. Growth extends up on to tonsils. Tongue furred, and considerable fœtor.

(*d*) One enlarged near L. angle. Another, size of walnut, beneath L. sterno-mastoid two and a half inches below lobule of ear.

(*e*) No history of syphilis. No cancer in family. Irritation by teeth (*v. supra*).

(*f*) May 8th.—Gland under sterno-mastoid removed (May 19th.—An acute abscess of R. elbow delayed matters, being opened May 25th). June 5th.—L. cheek split, soft palate

found partially involved, and diseased part removed with thermo-cautery, then half of tongue and one tonsil removed with scissors.

(*g*) Breathing bad on night of operation. Died June 12th.

(*h*) Death seven days after operation.

(*i*) P.M. report.—Broncho-pneumonia and congestion of lungs. R. worse.

(*j*) Death.

(*k*) Registrar reported on the portion removed, "Typical epithelioma."

Case 10.

(*a*) Male, 51 ; Mr. Golding-Bird.

(*b*) Three months ago noticed small, soft pimple on floor to L. of frænum. This increased slowly at first, but rapidly last three weeks.

(*c*) Tongue and floor of mouth, from R. of frænum to L. second molar, occupied by a lobular mass. Anterior edge elevated abruptly. Periosteum of jaw involved.

(*d*) Enlarged glands in L. submaxillary region.

(*e*) No history of cancer.

(*f*) Sept. 3rd.—Preliminary laryngotomy. Incision along L. lower jaw. Muscles divided till floor exposed. Growth freed from inner surface of jaw with raspatory. Tongue then drawn out of mouth and excised with scissors. Considerable hæmorrhage. Incision plugged with gauze.

(*g*) Sept. 5th.—Plug removed ; most offensive. Drainage-tube substituted. 10th.—Laryngeal tube removed. 11th.—Fed by mouth. 14th.—Fistula between mouth and external wound closed.

(*h*) Relieved.

(*j*) Discharged Sept. 18th. All healed except just near symphysis.

Case 11.

(*a*) Male 51 ; Mr. Jacobson.

(*b*) Fifteen years ago a blister on R. side of raphe one and a half inches from tip. This has gradually spread.

(*c*) An irregular elevated mass on R. side of tongue, fissured in centre ; irregularly tuberculated round margin. In front distinctly warty.

(*d*) An enlarged gland, size of a walnut, below and anterior to R. angle.

(*e*) Apparently no syphilis. Used to smoke on R. side and get a sore tongue, but has not smoked for six years.

(*f*) Nov. 2nd.—Each half removed in succession with scissors. Some trouble with R. lingual artery. Copious oozing quarter of an hour after operation, controlled by pressure and ice.

(*g*) Up four days after operation. An enlarged gland to be felt on L. as well as R. Discharged Nov. 20th.

(*j*) Seen two years after operation. Stump sound, no enlarged glands. Circumvallate papillæ still prominent. No ulceration. General health excellent.

(*k*) Two months' specific treatment had had no effect, so Mr. Jacobson thought it a gummatous tumour that had taken on a malignant character.

Case 12.

(*a*) Female, 35; Mr. Jacobson.

(*b*) A little white blister three months before admission.

(*c*) Ulcer on middle third of left side. Indurated to raphe and almost to tip, also a nodule to R. of raphe. Pain in area of auriculo-temporal.

(*d*) Questionable enlargement of a gland in L. submaxillary region.

(*e*) Doubtful syphilitic history.

(*f*) Died during administration of anæsthetic.

(*k*) No mention of microscopic examination of tongue.

Case 13.

(*a*) Male, 60; Mr. Symonds.

(*b*) Four months ago a sore place on L. margin of posterior part of tongue, attributed to second bicuspid. Ulcer gradually spread to under surface of L. side.

(*c*) Fissured ulcer along under part of tongue on L. Edges raised, sharp, well defined, and indurated. Surface irregular, with numerous caseating white points. No discharge. Much fœtor. Induration all round ulcer, and on dorsum as far as raphe. Floor of mouth involved on L. from frænum to second molar. Mobility very little impaired. Very little pain on mastication. Most pain where bicuspid was extracted a month previously.

(*d*) No glands appear affected.

(*e*) Syphilis forty-two years ago. No syphilitic signs remain. Irritation by teeth (*v. supra*).

(*f*) July 10th—Glosso-alveolar mucous membrane first divided with knife. Tongue then removed by Whitehead's method. Towards end of operation suddenly cyanosed ;[1] immediate tracheotomy.

(*g*) Same evening considerable hæmorrhage from stump, arrested with thermo-cautery. Next morning temperature 104·6°. Died in afternoon.

(*h*) Death.

(*i*) July 11th.—P.M.—A sponge found impacted in glottis, above the tracheotomy tube. Lower lobe of R. lung pneumonic. L. lower lobe broncho-pneumonic. Pus in tubes on both sides. Spleen like a fever-spleen. Kidneys patchy and anæmic; large clot in pulmonary artery, probably ante-mortem.

(*j*) No account of actual mode of death, only said to be sudden. No report of microscopic examination of tongue.

1884—Case 14.

(*a*) Male, 49; Mr. Bryant.

(*b*) Five months ago tenderness of R. side of tongue, attributed to a sharp tooth. Rapid increase during last three weeks.

(*c*) Indurated ulcer of posterior third L.

(*e*) Mother, cancer of breast. Irritation of teeth (*v. supra*).

(*f*) June 27th.—Sharp hooks passed through tongue, and galvanic écraseur applied behind them. All in front of them removed. The growth found on section to extend to within a line of the point of division.

(*g*) June 29th.—Great fœtor. Mouth rinsed frequently with boracic lotion. July 5th.—Slough beginning to separate. 14th.—Still separating. 17th.—Discharged.

(*h*) Relieved.

(*j*) Report says, "Discharged practically well."

Case 15.

(*a*) Female, 45; Mr. Bryant.

(*b*) Four months ago a small pimple; stationary for a month, but then spread.

[1] The cyanosis, as was subsequently ascertained at the autopsy, was caused by the impaction of a small sponge which had become detached from a holder.

(*c*) An ulcer of anterior third, L. One and a quarter inches from before back; seven eighths of an inch transversely. Suffering from profuse salivation.

(*d*) Enlarged glands in L. submaxillary triangle.

(*e*) Syphilis negatived.

(*f*) Died during administration of anæsthetic.

Case 16.

(*a*) Female, 43; Mr. Bryant.

(*b*) Thirteen or fourteen years ago, pain on R. side of tongue, and a fissure attributed to teeth. A year later four stumps extracted. Ulceration increased steadily. All teeth on R. side eventually removed.

(*c*) Large ulcer on base of tongue on R. side. Suffering from profuse salivation, and pain in area of auriculo-temporal.

(*e*) Irritation of teeth (*v. supra*).

(*f*) No operation on account of bad circulation and probable heart disease.

Case 17.

(*a*) Male, 53; (Mr. Bryant) Mr. Lucas.

(*b*) Fifteen months ago L. side of tongue irritated by a tooth; five months ago, tooth removed. Three months ago induration noticed about scar.

(*c*) Dorsum of L. side affected, extending to raphe. Finger can reach beyond it. Surface excavated. Floor of mouth free.

(*d*) Enlarged gland at L. angle, said to vary in size.

(*e*) Irritation of teeth (*v. supra*). Syphilis negatived. Uncle died of cancer.

(*f*) March 26th.—Mr. Lucas operated with galvanic écraseur. Tip of tongue left intact. It was found that all the growth was not removed.

(*g*) March 31st.—Gland in neck twice as large as on admission. April 2nd.—Can swallow easily. Discharge not very foul. April 6th—10th.—Slough coming away; profuse salivation. April 16th.—Discharged.

(*h*) Relieved.

(*j*) On discharge the gland was smaller than just after the operation, and its removal was thought unadvisable.

Case 18.

(*a*) Female, 62; Mr. Durham.

(*b*) A sore on L. side of tongue, caused two years ago by false teeth.

(*c*) A comparatively small ulcer, involving middle third of L. side of tongue.

(*d*) None on admission.

(*e*) Syphilis negatived. Irritation of teeth (*v. supra*).

(*f*) March 14th.—A semilunar piece removed with scissors. Hæmorrhage arrested by torsion. Edges of mucous membrane sutured.

(*g*) Sutures removed on seventh day. Uninterrupted recovery.

(*h*) Relieved.

(*i*) Readmitted sixteen months later, and had some enlarged glands removed from L. submaxillary region.

(*k*) At time of operation the section was said to be well free of the growth. No mention of condition of stump on readmission.

Case 19.

(*a*) Male, 50; Mr. Durham.

(*b*) Fifteen months ago an ulcer on L. side of tongue, size of a threepenny-piece; disappeared after six weeks; latent for nine months; then broke out again and spread rapidly.

(*c*) Extensive ulceration of L. side.

(*d*) A gland, size of a walnut, in L. submaxillary region (one month's history).

(*e*) Probably syphilis.

(*f*) June 6th.—Preliminary laryngotomy. Operation commenced on L. side for removal of glands. Respiration failed, consequently operation deferred. June 10th.—Left cheek divided. Sponge in pharynx. Diseased part removed with scissors. A suture left in the stump; this was removed the next day "with some difficulty."

(*g*) Some hæmorrhage on evening of operation. June 12th.—Much fœtor; drowsy. 14th.—Erysipelas of face. 15th.—Temperature 104°. 16th.—Laryngotomy tube removed. 17th.—Respiration rapid, temperature 104·4°. 18th.—Death.

(*h*) Death.

(*i*) P.M. report.—Broncho-pneumonia due to food passing into air passages. Death apparently due to an exceptionally large fragment.

(*k*) For a month previous to operation had been under vigorous mercurial treatment, with no effect on the ulcer.

Case 20.

(*a*) Male, 60; Mr. Durham.

(*b*) Five months ago a swelling, size of pea, in middle of tongue. This ulcerated; also noticed lumps about edge.

(*c*) No swellings on dorsum; two on R. edge. Profuse salivation.

(*d*) No glands on neck; ? both submaxillary glands somewhat enlarged.

(*e*) Syphilis denied. Ten years ago had an ulcer on the tip of his tongue, which disappeared. Since then more or less liable to "blisters" on his tongue whenever he catches cold. Moderate smoker.

(*f*) Oct. 27th.—Preliminary laryngotomy. L. cheek divided. Whole of tongue removed by Whitehead's method. Suture left in stump.

(*g*) Slight hæmorrhage an hour after operation easily arrested by ice. Nov. 4th.—Temperature 102°. Pain in L. side. 5th.—Nasal œsophageal tube removed, and patient fed by mouth. 6th.—Laryngotomy tube removed. Dulness of L. base up to angle of scapula, with tubular breathing. 7th and 8th.—Antipyretics. 9th.—Rapid respiration and death.

(*h*) Death.

(*i*) P.M. report.—Stump found to be infiltrated. No enlargement of glands or secondary deposits. Double broncho-pneumonia. Semi-digested food in air passages.

(*j*) Anti-syphilitic treatment had been employed Oct. 8th—27th with no benefit.

Case 21.

(*a*) Male, 50; Mr. Davies-Colley.

(*b*) Two years ago a number of small white pimples on tip of tongue, much worse last two months.

(*c*) Whole of R. side, as far as can be seen, occupied by a papillomatous-looking mass, with patches of red granular and

yellowish scaly material; inner edge of growth very sharp, overlapping L. side of tongue. The mass is rough, hard, and tender. On L. side of tongue an ulcer about size of sixpenny-piece, red, smooth, hardly raised above level of surrounding parts.

(*d*) One enlarged gland near R. angle.

(*e*) Syphilis negatived. Smokes two ounces a week—not a clay pipe.

(*f*) May 12th.—Tongue divided down raphe, each half removed with whipcord écraseur. Very little hæmorrhage.

(*g*) Nasal œsophageal tube for five days. Condy's fluid for washing mouth frequently. May 17th—20th.—Slough clearing, gland diminishing in size. 26th.—Discharged; slough quite cleared.

(*h*) No report of removed portion.

Case 22.

(*a*) Male, 47; Mr. Davies-Colley.

(*b*) Twenty years ago an ulcer on tongue beginning as a small white pimple, leaving a fissure which eventually healed. Since then several similar eruptions which have healed. Has constantly had sores on lips, which have yielded to specific treatment. Three months ago present sore commenced as a crack.

(*c*) Nearly whole of tongue swollen and indurated. A deep excavated ulcer behind middle third.

(*d*) Enlarged glands on L.

(*e*) Syphilis apparently. Report incomplete.

Case 23.

(*a*) Male, 39; Mr. Davies-Colley.

(*b*) Several times has had sores on tongue which have readily healed. Nine months ago felt a lump, size of pea, on R. of median line, half an inch from tip. Five months ago this became tender and has never healed since, but steadily enlarged.

(*c*) A warty papillomatous growth projecting from dorsum of tongue, three quarters of an inch behind tip to R. of raphe, "like a mushroom."

(*d*) A small gland under R. ramus.

(*e*) Constant smoker, clay pipe. No family history of cancer.

(*f*) Sept. 26th.—Division down median line with scissors till behind growth, then outwards to R. border in a curved direction. Extremities of incision approximated and sutured.

(*g*) Œsophageal tube used. Sept. 28th.—Some fœtor. 30th. —Some bleeding. Oct. 6th.—Nasal tube still used, much less fœtor, sutures have disappeared, inner part united by first intention, outer part is granulating. 11th.—Fed by mouth.

(*h*) Relieved.

(*j*) Discharged Oct. 17th; no gland could now be felt.

(*k*) Highest temperature 99·2°. Registrar reports "typical epithelioma."

Case 24.

(*a*) Male, 53; Mr. Davies-Colley.

(*b*) Four months ago a little blister, then a little "hole," then several of these appearing to coalesce on tongue.

(*c*) Practically whole tongue involved, but not frænum or inferior maxilla. Much salivation, and auriculo-temporal pain.

(*d*) Glands near either angle enlarged; most marked on L.

(*e*) No history of cancer. Syphilis thirty years ago, followed by secondary and tertiary phenomena. Moderate smoker; clay pipe.

(*f*) Dec. 28th.—Cyanosis and spasm at commencement of operation, so laryngotomy performed. Mouth opened with difficulty. Tongue so large that L. cheek divided. After dividing frænum and pulling tongue well forward it was divided mesially, and each half removed by whip-cord écraseur.

(*g*) Œsophageal tube kept in for two days; after this only passed when required. Some cough and rhonchi. Laryngotomy tube removed on night of operation, wound healing by Jan. 7th. 20th.—Has fairly recovered. 25th.—Glands on R. removed; found to be infiltrated. Feb. 8th.—Glands on left removed. Feb. 11th.—Dyspnœa from swollen epiglottis. [Temp. rising till 14th; after that of a hectic type till 23rd; then falling to nearly normal till March 3rd; subnormal March 7th—21st.] Feb. 15th.—Mischief at base of R. lung; fine crepitations. Cellulitis of L. side of neck. 26th.—Cellulitis extending over lower jaw. March

10th.—An abscess opened at lower part of cellulitic region, containing thick green fetid pus. 12th.—Patient semi-comatose.

(*h*) Died exhausted March 22nd.

(*i*) P.M.—Recurrence in cervical glands. Large mass of cancer on sides of neck, most on R., having destroyed sterno-mastoid, and involving the clavicle and ribs. R. pneumo-gastric and vessels involved. Tongue well healed, but recurrence. An abscess in the lung communicating with a dilated bronchus. Secondary nodules in L. kidney. Syphilitic fibroid degeneration of kidneys.

Case 25.

(*a*) Male, 57; Mr. Lucas.

(*b*) Two years ago "a whiteness" on R. side of tongue where irritated by a sharp tooth. Four months ago this ulcerated and began to spread. Has been hard all the time.

(*c*) R. side involved from just behind tip to junction of middle and posterior thirds. Encroaches three quarters of an inch on under surface; less on dorsum.

(*d*) No enlarged glands detected.

(*e*) Never smoked much; not at all lately. Irritation by teeth (*v. supra*). Has glycosuria.

(*f*) March 26th.—Galvanic écraseur used, which broke once. Some difficulty in arresting hæmorrhage, vessels having to be dissected out with a blunt director for torsion. Oozing arrested with thermo-cautery and by torsion.

(*g*) Fed by mouth next day. Lotio Pot. Permang. and Gargarisma Boracis. Feb. 2nd—10th.—Slough coming away. 18th.—Discharged.

(*h*) Relieved.

(*k*) No report on part removed. Highest temp. 101·5°, two days after operation.

Case 26.

(*a*) Male, 56; Mr. Jacobson.

(*b*) Twelve months ago a lump, the size of a pea, on L. side of tongue.

(*c*) An ulcerated surface on L. side, from just behind tip well into posterior third.

(*d*) A gland the size of a pigeon's egg in L. submaxillary region.

(*e*) Maternal uncle had cancer of tongue. Is a confirmed smoker.

(*f*) May 13th.—Glands removed from L. side of neck. Some markedly adherent to veins. All healed by 22nd. 24th.—Preliminary laryngotomy; sponge in fauces. Tongue divided, and each half removed with scissors. Some trouble in arresting hæmorrhage. Pulse bad.

(*g*) Uninterrupted recovery.

(*h*) Relieved.

(*j*) Discharged June 22nd. Some induration remaining, feared to be disease, owing to rapid conclusion of operation. Glands under sterno-mastoid enlarging.

(*k*) Laryngeal wound rather slow in closing. No fœtor at any time after operation.

Case 27.

(*a*) Male, 73; Mr. Jacobson.

(*b*) Seven months ago tip of tongue noticed to be white; this became painful a month later.

(*c*) Front of middle third of tongue involved, the ulceration perforating to floor.

(*d*) Several enlarged glands about L. angle.

(*e*) Father died of cancer of tongue.

(*f*) Sept. 4th.—Tongue removed by Whitehead's method. No complications.

(*g*) After patient had been returned to bed an artery spirted and was ligatured with some trouble. Progressed well till 10th, when temperature rose. Some delirium. Deficient entry of air to L. base, and occasional moist sounds. 11th.—Temp. 103·2°.

(*h*) Death.

(*i*) Died eight days after operation. P.M.—Heart small, mitral thickened. Liver, spleen, kidneys, all normal. Old fibroid induration at apices of both lungs, with calcareous nodules and dilated tubes. Much pus in tubes. Hypostatic congestion of lower lobes. No phlebitis. Floor of mouth quite clear.

1885—Case 28.

(*a*) Male, 53; Mr. Bryant.

(*b*) Four months history of soreness about R. edge, spreading slowly.

(*c*) Floor of mouth and under surface of tongue on R. side chiefly affected, but spreading to L. Growth hard, red, with white epithelial flakes interspersed. Movement much impaired.

(*d*) Submaxillary glands hard and tender.

(*f*) Dec. 12.—Affected parts removed with scissors. Considerable hæmorrhage. Ranine artery ligatured. Tr. Ferri Perchloridi used freely. Bleeding for three hours in ward. Jan. 16th.—Mr. Lucas divided lower jaw at symphysis, drew the tongue forwards, ligatured the R. dorsalis linguæ, dissected out the R. submaxillary gland; whole growth removed, both sublingual arteries ligatured, sublingual glands also removed. Infiltrated periosteum removed from R. side of symphysis. The stump of the tongue and the two flaps of the submental incision all taken on one suture to prevent the stump falling backwards. Symphysis put in a wire splint by Mr. Pedley.

(*g*) Eight days after the first operation there was swelling of the submaxillary region. A fortnight later a recurrent nodule was noticed under the tongue. After the second operation patient recovered without any complications, and was up on the thirteenth day.

(*h*) Relieved.

(*j*) Discharged May 1st, still wearing jaw-splint.

Case 29.

(*a*) Male, 59; Mr. Bryant.

(*b*) Twenty years ago white spots on R. side near tip. Cauterised, and teeth filed. No further trouble till two months ago, when present sore began as a red spot.

(*c*) On R. side of tongue some raised white spots, hard to the touch. On L. side of dorsum extending into the substance a hard lump not much raised above surface, but redder than surrounding parts, shiny, with indurated edges. Movements of tongue unimpaired.

(*d*) One enlarged gland on L. side of neck.

(*e*) No history of cancer.

(*f*) Curved needles passed behind growth, and galvanic écraseur used. Anterior two inches of tongue removed. One vessel needed torsion. Plug of iodoform gauze applied over wound.

(*g*) Five days after operation the slough coming away; some fœtor. Sixth day, some hæmorrhage, much fœtor and purulent sputum. Seventh day, slough cleared; coarse crepitations at L. base, but no dulness.

(*h*) Relieved.

(*j*) Discharged on eighteenth day.

Case 30.

(*a*) Male, 42; Mr. Bryant.

(*b*) Eight months ago small sore on L. side. This enlarged, and occasionally discharged.

(*c*) Copious hæmorrhage just before admission. A lump, size of a walnut, far back on left side, and below this a bleeding ulcer.

(*d*) Hard enlarged glands in both submaxillary regions.

(*e*) Inveterate smoker.

(*f*) Patient refused operation till Mr. Bryant thought it too late.

(*g*) Treated with Chian-terebinth and Resorcin.

(*h*) Temporary slight relief.

(*j*) Discharged Dec. 16th. Readmitted in March, 1886, and Mr. Bryant removed a protruding piece of the growth between the gum and lower lip.

(*k*) Previous to admission had been to Charing Cross Hospital, and there had had his tongue injected daily with some fluid which gave him some temporary relief.

Case 31.

(*a*) Male, 51; Mr. Bryant.

(*b*) Four months ago noticed tongue sore, and soon afterwards difficulty in deglutition.

(*c*) Tongue swollen, movements limited, difficulty in speaking. Tongue hard, in parts glazed, margins notched by teeth, whole appears infiltrated. Much salivation and pain. Marked fœtor, very little ulceration.

(*d*) Hard and enlarged glands on both sides, submaxillary and cervical.

(*e*) Syphilis.

(*f*) No operation thought advisable. Report unfinished.

Case 32.

(*a*) Male, 74; Mr. Bryant.

(*b*) A year ago acute pain in R. submaxillary region, then small ulcers on R. side of tongue, which have increased rapidly lately.

(*c*) Tongue and floor of mouth involved. An ulcerating growth with prominent edges. Tongue œdematous, very tender, immovable. Profuse salivation. Floor involved.

(*d*) Glands enlarged on both sides.

(*e*) Smokes a clay pipe. Syphilis negatived.

(*f*) No operation thought advisable.

(*g*) Resorcin and Chian-terebinth used as a lotion.

(*h*) Slight temporary relief.

(*j*) Discharged eight days after admission.

Case 33.

(*a*) Male, 60; Mr. Durham.

(*b*) Twenty years ago a crop of ulcers, which were cured. Six years ago the same. Two months ago a sore near tip.

(*c*) Two warty-looking growths of dorsum near tip, indurated at their bases and appearing to invade the organ. Most of tongue and the growths themselves insensitive. Also a fissure on dorsum.

(*d*) Hard enlarged glands in neck.

(*e*) Evidence, but no history, of syphilis. A smoker; tongue always got sore if he smoked much.

(*f*) June 30th.—Anterior two thirds of tongue removed by Whitehead's method.

(*g*) July 2nd.—Very little fœtor; no slough, but greyish granulations. 4th—18th.—Pain in chest and cough; pain at R. base, but no particulars in report. Nasal tube for first twenty-four hours, then enemata for some days.

(*h*) Relieved.

(*j*) Discharged July 29th.

(*k*) Registrar reported two warty growths and a longitudinal fissure with lateral offsets on dorsum. The larger wart infiltrates muscle beneath, the smaller does not. The mucous

membrane to L. of the fissure is abnormally smooth, and devoid of papillæ.

Case 34.

(*a*) Male, 65; Mr. Durham.

(*b*) Two months ago noticed sore on R. side of tongue which has enlarged.

(*c*) Ulcer, size of a shilling, on R. side, not reaching middle line, very painful, edges indurated.

(*d*) R. sublingual gland indurated. Tender gland in front of R. sterno-mastoid.

(*e*) Mother died of cancer of breast. Syphilis denied. Confirmed smoker.

(*f*) Aug. 18th.—Preliminary laryngotomy, and R. cheek divided. Whole of tongue removed by Whitehead's method.

(*g*) At first nasal tube, then enemata. Three days after operation fed by mouth. Aug. 24th.—India-rubber laryngeal tube. 25th.—Union of cheek perfect. 26th.—Tube removed.

(*h*) Temporary relief.

(*j*) Sept. 7th. — Recurrence in stump. No interference thought justifiable.

Case 35.

(*a*) Male, 57; Mr. Howse.

(*b*) Two years ago a white streak on dorsum which he peeled off. Six months ago a wart on dorsum size of a pea. This cauterised, and a sore left, which has constantly increased.

(*c*) Ulcer of R. side of dorsum. Raised, uneven, fairly defined outline. Hard, not painful. Slough, size of sixpence, about centre. R. border free. Slight excoriation, and two red patches on corresponding parts of hard palate.

(*d*) Enlarged glands on R.

(*f*) Aug. 25th.—Mr. Jacobson removed whole of tongue with scissors. Soft tissue of tongue torn with a director, and the lingual artery ligatured without hæmorrhage. One vessel on floor ligatured.

(*g*) Slight oozing same evening. Aug. 26th. — Wound covered with a sweet blood-clot. Some rhonchi audible. 28th.—Greenish muco-purulent nummular sputum, moist sounds and fine crepitation over L. base. Sept. 3rd.—Slough coming

away well. 7th.—A gland the size of a cherrystone at L angle.

(*h*) Relief.

(*j*) Discharged Sept. 16th. Mouth clean and sweet, no discharge. Stump contracted. Epithelium extending rapidly over granulations. Can eat ordinary food without difficulty. Speech rapidly improving.

(*k*) Aug. 26th.—Enemata and suppositories. Sept. 2nd.—Fluids by mouth. 7th.—Chicken.

Case 36.

(*a*) Male, 55; Mr. Howse.

(*b*) Twenty-two years ago ulcers on R. side of tongue, lasting six or seven years; treated with lunar caustic. Became sore again three months ago. Hæmorrhage during last fortnight, lost a pint three days before admission.

(*c*) Ulceration on R. side, floor, and dorsum, far back.

(*e*) No history of cancer. Either syphilis or gonorrhœa thirty-four years ago.

(*f*) Sept. 25th.—Whole tongue removed with galvanic cautery in three stages of application: (1) horizontal, dividing genio-glossi; (2) perpendicular and transverse, dividing L. half at root; (3) same for R. half. No hæmorrhage. Tannin applied.

(*g*) Sept. 26th.—Great fœtor. 28th.—Much slough, some removed. 30th.—Hæmorrhage. Oct. 2nd.—Hæmorrhage ceased. 3rd.—Hæmorrhage again. Temp. 104°. Pulse 160. Respirations 42. Pulmonary symptoms, not fully described.

(*i*) Death Oct. 4th.

(*k*) No copy of post-mortem report.

Case 37.

(*a*) Male, 45; Mr. Davies-Colley.

(*b*) Five years ago white blisters that healed. Six months ago a fissure on dorsum.

(*c*) An oblique ridge, running inwards and forwards from right edge, nearly an inch in length. In front of this a glazed patch occupying R. half of dorsum, extending to tip. Rest of dorsum, except L. edge, more or less infiltrated. Behind ridge is a small ulcer with a glazed stony patch of cancer posterior to it. Tongue somewhat fixed, and much pain on movement.

(*d*) Hard tumour on R. side of neck, 3 in. × 3 in., lying one inch above sterno-clavicular articulation.

(*e*) No evidence of syphilis. Phthisical family history.

(*f*) Dec. 19th.—Tongue divided longitudinally, and each half treated successively with whip-cord écraseur. L. side first; some remained undivided, and this was touched with the thermo-cautery. The R. side then treated; during this renewed hæmorrhage on L., necessitating ligature. When all but artery and nerve were divided, the former was ligatured behind the écraseur, and the strand of tissues divided with the thermo-cautery. Growth found to extend to floor of mouth on R. side; this with the R. sublingual gland removed. Still some growth in stump; this removed by a fresh application of écraseur, with very little hæmorrhage.

(*g*) Dec. 27th.—Cough and pleuritic rub on R. 30th.—Slight hæmorrhage. Jan. 1st.—Hæmorrhage again. 5th.—Cough worse. Dulness of L. side at base; double pleurisy. 5th—30th.—Pulmonary trouble persisting; glands in neck enlarging. Feb. 5th.—Abscess in neck burst. 13th.—Death.

(*h*) Death.

(*i*) P.M.—Recurrent growth in epiglottis, pillars of fauces, and floor of mouth. Secondary deposits in glands, pleura and peritoneum; also a few cancerous patches in lungs. In L. lung a large foul cavity.

Case 38.

(*a*) Male, 58; Mr. Davies-Colley.

(*b*) Three months ago a sore on R. side of tongue, and one molar extracted. Has suffered lately from a cough, which causes tongue to bleed.

(*c*) R. side of tongue swollen and indurated, from half an inch behind tip to behind last molar. The swelling overlaps the gum, and is indented by the teeth. An ulcer with a cavity about the size of an acorn extends inwards, opposite second bicuspid; the swelling covers this cavity, so that it cannot be seen unless tongue is raised. Tongue very fixed.

(*d*) Four glands, the size of hazel nuts in R. submaxillary triangle.

(*e*) ? Mother cancer of breast. Irritation by teeth (*v. supra*).

(*f*) Nov. 21st.—R. lingual artery ligatured and the glandular

mass exposed in this proceeding removed. R. lingual-gustatory nerve also divided from inside of mouth.

(*g*) Wound rather foul, healing by granulation.

(*h*) Pain immensely relieved.

Case 39.

(*a*) Female, 60; Mr. Davies-Colley.

(*b*) A year ago a sore on R. side of tongue; a tooth filed, but no relief; gradually worse, the ulcer spreading rapidly during last three months.

(*c*) Oval sore on R. side near base; rough uneven surface, sloughy; hard, raised, everted edges. No loss of power of protrusion.

(*d*) No enlarged glands detected.

(*e*) Irritation of teeth (*v. supra*).

(*f*) Oct. 2nd.—R. lingual artery first ligatured, and then R. half of tongue excised with scissors; some hæmorrhage from far back. One vessel needed ligature. Oozing arrested by pressure and with Tr. Ferri Perchlor.

(*g*) Oct. 10th.—Up in evening. 13th.—Can eat arrowroot. 14th.—Low diet. 20th.—Discharged.

(*h*) Relieved.

(*j*) Readmitted January, 1887, for recurrence in glands of neck which were removed; tongue healthy. Died in December, 1887, from further recurrence.

Case 40.

(*a*) Male, 63; Mr. Lucas.

(*b*) About nine months ago a lump appeared on tongue.

(*c*) A lump with irregular indurated raised edges; in the centre a fetid slough.

(*d*) Glands under jaw on R. enlarged and tender.

(*e*) Has a syphilitic rash on scalp. No family history of cancer.

(*f*) Sept. 11th.—Enlarged glands removed from R. submaxillary space. Wound healed by 17th. 25th.—Tongue removed by Whitehead's method.

(*g*) Hæmorrhage on evening of operation controlled by ice. Oct. 9th.—Patient up; has had no rise of temperature.

(*h*) Relieved.

(*k*) Nutrient enemata for first three days, then fed by a feeding-cup with an india-rubber tube.

Case 41.

(*a*) Male, 40; Mr. Jacobson.

(*b*) Twenty years ago small white ulcers on tongue. Five months ago a small white blister on L. side.

(*c*) An ulcerated surface on L. side one inch from tip, measuring one and a half inches antero-posteriorly, and three quarters of an inch transversely. On the dorsum it reaches half way from edge to raphe. Not deeply excavated; much fœtor; whitish-yellow slough on surface; no attempt at granulation. A smaller ulcer anterior to main one. The anterior inch of L. side (which is free from ulceration) and also the under surface of the tip show numerous white streaks, as of white paint, clearly allied to leukoplakia. Similar patches on R. commissure of lips, and also on gums above upper incisors.

(*d*) Enlarged glands in L. submaxillary region.

(*e*) Syphilis denied. Smokes 2 oz. a week in a clay pipe. Also tongue irritated by teeth.

(*f*) Sept. 11th.—L. half of tongue removed by Whitehead's method. Artery secured before division, the muscular tissue having been torn through with a blunt director.

(*g*) Sept. 12th.—Side of tongue and floor sloughy, and some œdema about frænum. No submaxillary cellulitis. Slight fœtor. 13th.—Still slightly sloughy. Granulations, however, appearing. 14th.—Patient up. 15th.—Wound granulating well.

(*h*) Relieved.

(*j*) Discharged Sept. 22nd, with some suspicious indurated points, to be watched as an out patient. Readmitted April, 1885, under Mr. Symonds for enlarged glands in L. submaxillary region. Operation commenced, but only one gland removed, the number of those affected being found to be so great. Seen in May. No sign of disease in tongue, but glands enlarging rapidly.

Case 42.

(*a*) Female, 38; Mr. Jacobson.

(*b*) Three years ago an ulcer of L. side of tongue near tip;

this troublesome for nine months. Has lately had sharp, shooting pain along L. side of tongue.

(*c*) About centre of L. side a depressed white patch like a leucoma, with one or two sulci, which may be fissures which have healed, parallel to edge of tongue.

(*d*) None.

(*e*) Mother died of cancer of cervix.

(*f*) Sept. 10th.—Whitehead's method; tongue being first split longitudinally with bistoury. Lingual artery secured as in last case; it, however, lay very low, and was hard to get at.

(*g*) Sept. 10th.—Some hæmatemesis in evening. 14th.—Some fœtor. 17th.—No fœtor, granulating well. 22nd.—Patient up.

(*h*) Relieved.

(*j*) No enlarged glands detected when discharged.

Case 43.

(*a*) Male, 51; Mr. Symonds.

(*b*) Four months ago a small red spot on floor under tongue opposite last R. molar. A month later a red string-like process spread from this to frænum; very sore, but no discharge. This has gradually increased in size. A month ago it became white.

(*c*) Much fœtor. Floor and under surface of tongue on R. side covered with a white growth, with a red, rough, everted edge, extending from frænum to behind last molar. Pain in right side of lower jaw. Cannot protrude tongue, but has fair lateral movement. There is a cleft between the tongue and the teeth of a greyish colour. The growth reaches the teeth, and the mucous membrane along the gums is destroyed. Dorsum indurated. Patient cannot eat solid food.

(*d*) The R. submaxillary salivary and also neighbouring lymphatic glands enlarged.

(*e*) Inveterate smoker, using clay pipes.

(*f*) April 24th.—Ligature of both lingual arteries, also facial vessels on R. Removal of right submaxillary salivary and of several lymphatic glands. Floor of mouth accidentally perforated by finger. [This operation followed by pyrexia. L. side healed well, but R. somewhat foul owing to communication with mouth.] April 27th.—Second operation. Preliminary tracheotomy. Mucous membrane separated from jaw

with a raspatory. Whole of tongue removed with scissors. Very little hæmorrhage.

(*g*) Temperature and respirations ran up from the same evening, and patient died next morning.

(*h*) Death.

(*i*) P.M.—Some growth found left in stump. Broncho-pneumonia (chiefly in upper lobes).

Case 44.

(*a*) Male, 64; Mr. Symonds.

(*b*) Ten months ago bad cold, with pain and difficulty of deglutition. For last six months only fluid diet. Two months ago tongue cauterised.

(*c*) An oval superficial ulcer of about an inch and a half diameter far back on floor of R. side. Induration extending a short way into tongue. No discharge. Cannot protrude tongue. Ear-ache on R.

(*d*) One enlarged gland at anterior border of R. masseter at level of angle of mouth. One on each side of neck.

(*e*) No irritation of teeth. Syphilis negatived. Confirmed smoker.

(*f*) Oct. 7th.—R. lingual artery first ligatured. A segment of the tongue (R. middle third) removed with scissors. Mucous membrane removed from jaw.

(*g*) Fed with a nasal tube for five days. Temp. rose for first five days, reaching 103·6°. Temp. fell on administration of quinine. Some hæmorrhage day after operation, fœtor commencing two days after operation and lasting three days. Seven days after operation some cellulitis over R. sterno-mastoid, spreading from the incision for ligature of lingual artery. This extended down over sternum but disappeared in three days, being accompanied by no marked pyrexia.

(*h*) Relieved.

(*j*) Discharged October 21st.

1886—Case 45.

(*a*) Male, 58; Mr. Bryant.

(*b*) Five weeks ago tongue became painful and swollen. Soon afterwards neck swollen.

(*c*) Tongue swollen, œdematous, and painful. L. side in-

dented by teeth. A swelling one inch by half an inch on L. side. Floor on L. swollen and indurated. No actual ulceration. Increased salivation. Pain on L. side of head. No solid food for five weeks. Cannot protrude tongue beyond teeth.

(*d*) Smokes much, clay pipe. Doubtful history of cancer occurring in his sister.

(*f*) Treated with Resorcin and Chian-terebinth for a fortnight. Then L. lingual gustatory divided.

(*j*) Discharged a month after admission beginning to suffer from pressure symptoms in neck.

Case 46.

(*a*) Male, 77 (Mr. Bryant); Mr. Lucas.

(*b*) Ten months ago noticed a small sore spot on L. side near tip, which has steadily increased.

(*c*) An ulcer on L. side extending from near tip to posterior third. Induration extending to floor. Epitheliomatous characters.

(*d*) Enlarged glands in submaxillary region.

(*e*) No history of cancer. Never smoked much. Some leucoma on dorsum.

(*f*) Aug. 31st.—Tongue excised with scissors. Hæmorrhage slight, most from R. dorsalis linguæ.

(*g*) Nasal tube first two days. Temperature 101·4° on sixth day. Report incomplete.

(*h*) Relief.

(*k*) Discharged Oct. 6th. The whole tongue was removed to about a quarter of an inch behind foramen cæcum. Incision passed rather near growth.

Case 47.

(*a*) Male, 63 (Mr. Bryant); Mr. Lucas.

(*b*) Twelve years ago sore spot on R. side of dorsum about half way back. Tongue soon became swollen and covered with white fur. Two years ago noticed a small lump in the painful area. Six months ago ulceration began. Three weeks ago considerable hæmorrhage.

(*c*) An elevated ($\frac{1}{8}$ inch) ridge of hard tissue running from tip to posterior third along middle line of dorsum. On

each side of this ridge a depressed sore, more extensive on R., of epitheliomatous character. Posterior third of tongue seems free from induration, as also floor of mouth. Immobility of tongue marked.

(*d*) Enlarged glands in R. submaxillary region.

(*e*) Used to smoke excessively, clay pipes. No history of cancer. Apparently no syphilis.

(*f*) June 18th.—Operation begun with galvanic écraseur, but first the wire broke, and then the battery power proved insufficient, so eventually excised with scissors.

(*g*) Nasal tube first two days. Then feeding-cup with tube. July 13th.—Glands removed from submaxillary region.

(*h*) Relief.

(*j*) July 28th.—Discharged. Tongue looks healthy, but still some hardness near base of R. anterior pillar.

Case 48.

(*a*) Male, 50 (Mr. Durham); Mr. Jacobson.

(*b*) Six years ago a sore on tongue said to be due to stomach, cured by medicine; has recurred whenever patient has been out of health. Nine weeks ago small raw place on R. side near tip, which has gradually got worse. Tongue has always been "scarry and rough."

(*c*) Large irregular sore all over tip of tongue, surface papillomatous and bright red, edges ill defined, base hard, tongue brawny, much fœtor. Pain intermittent, much tenderness. Increased salivation. Tongue bleeds readily.

(*d*) Enlarged glands behind jaw on L. A large hard lump behind sterno-mastoid above clavicle on L., tender, size of a hen's egg.

(*e*) Excessive smoking. Some venereal disease twenty-seven years ago, ? Syphilis.

(*f*) Aug. 17th.—Anterior half removed with scissors. A little bleeding the same evening, arrested with ice.

(*g*) Aug. 19th.—Rigor 5.30 a.m. 22nd.—Some slough. 26th.—Mouth cleaner. Gland in neck larger and harder.

Sept. 2nd.—Gland dissected down on through sterno-mastoid; found to be so adherent that it was opened and the pus evacuated. Jugular vein injured and ligatured. 7th.—Tongue stump looking very healthy.

(*h*) Relieved.

(*j*) Sept. 27th.—Discharged. Wound in neck not quite healed. Tissues are brawny down to clavicle and to middle line of chest, and upwards as far as the ear.

Case 49.

(*a*) Male, 49; Mr. Durham.

(*b*) A month ago a sort of pimple on L. side of tongue near tip, which was irritated by teeth and pipe. This became raw, enlarged, and hard, spreading along side of tongue. Two teeth extracted, but no arrest.

(*c*) A fungous ulcerated growth from tip to near base on L. opposite lower bicuspids. Surface irregular and greyish. Base hard and more red than rest of tongue. Tongue enlarged and cannot be protruded, bleeds readily, a foul discharge. Pain behind L. ear. Much fœtor.

(*d*) Glands enlarged in L. submaxillary region.

(*e*) Syphilis negatived. Inveterate smoker of foul pipes. History of irritation (*v. supra*).

(*f*) Aug. 13th.—Preliminary tracheotomy. L. cheek divided. Tongue excised with scissors.

(*g*) Fed with nasal tube. Aug. 14th.—Coughing blood through tracheal tube. 16th.—Tracheal tube constantly getting blocked. 18th.—Tongue granulating well. 19th.—Tracheal tube removed. 23rd.—Fed by mouth.

(*h*) Relieved.

(*j*) Discharged Sept. 3rd. Report incomplete.

Case 50.

(*a*) Male, 58; Mr. Durham.

(*b*) Had English cholera some years ago, and took large doses of mercury. The under surface of his tongue was sore for six months after this, being irritated by one of the bicuspids. The swellings on his tongue varied *pari passu* with his alcohol. Fourteen days ago present ulcer first noticed.

(*c*) An ulcer, size of a shilling, on R. side one inch from tip, centre depressed, margin thick, hard, and raised, floor indurated, sloughy and apt to bleed. Can only protrude tongue to right side. Some fœtor. Much salivation.

(*d*) Enlarged gland in R. submaxillary region.

(*e*) One brother died of cancer of liver. Apparently acute glossitis from mercurial salivation. Dental irritation. A smoker.

(*f*) March 23rd.—Preliminary laryngotomy and R. cheek divided. Rather more than anterior half of tongue excised (presumably with scissors). Bleeding points ligatured, seven pairs of Spencer Wells' forceps being needed during operation.

(*g*) March 24th.—Temp. about noon suddenly rose from normal to 103·2.° Died in about twelve hours.

(*h*) Death.

(*i*) P.M. report.—Small portion of growth remaining in stump. Secondary growths in submaxillary glands. Acute suppuration round trachea extending down into mediastinum; aortitis; aortic and mitral valves thickened.

Case 51.

(*a*) Male, 65; Mr. Davies-Colley.

(*b*) Seven weeks ago a sore spot on tongue attributed to a rough tooth; a fortnight later he noticed a small fissure. Extraction of the tooth diminished the pain, but the ulcer spread.

(*c*) An excavated ulcer, size of shilling, on under surface of R. side close to frænum. Thick everted edges, sloughy base, watery discharge. Increased salivation; cannot protrude tongue.

(*d*) No enlarged glands.

(*e*) No history of cancer. Smokes about half an ounce per diem. Irritation by teeth (*v. supra*).

(*f*) Aug. 7th, 1885.—Lingual arteries ligatured and tongue removed with scissors.

(*g*) Fed by nasal tube for eight days. Discharged Sept. 1st. Wounds in neck quite healed. Tongue free from pain and looks healthy. Swallows easily. [Sept. 9th.—Showed himself to Mr. Symonds. Floor of mouth hard and nodulated, stump of tongue also hard and covered with whitish matter. Nov. 20th.—Readmitted for recurrence in floor and stump. 25th.—R. digastric triangle opened; much hæmorrhage from facial vein. Facial artery ligatured; some glands removed; stump of tongue removed with whip-cord écraseur. Inner surface of inferior maxilla also cleaned. Same evening wound had to be opened for hæmorrhage from a branch of facial artery. Dis-

charged Feb. 10th, 1886, in weak condition with fistulous opening in neck.

Case 52.

(*a*) Female, 52; Mr. Golding-Bird.

(*b*) Nine months ago tongue began to swell, preceded for some days by a burning pain on L. side. Three years ago she used to suffer from ear-ache on this side.

(*c*) Deep ulceration of L. side with much induration. Cannot protrude tongue; much thick saliva.

(*d*) Enlarged gland.

(*e*) Rather a syphilitic history as regards her children; four stillborn, and two dying at five months.

(*f*) Oct. 2nd.—Anterior two thirds of tongue removed with scissors. Growth found to be more extensive, and consequently half of soft palate and part of floor of mouth removed.

(*g*) At first enemata. Oct. 4th.—Fed by mouth. Oct. 22nd. —Infiltrated gland removed from L. submaxillary region.

(*h*) Relieved.

(*j*) Nov. 2nd.—Discharged; external wound granulating up. A hard lump under L. sterno-mastoid. Mouth free from pain and discharge.

Case 53.

(*a*) Male, 56; Mr. Jacobson.

(*b*) Two months ago had a sore-throat, and then noticed a lump at back of mouth. First sought advice a fortnight ago. Slight hæmorrhage.

(*c*) Growth occupying L. half of soft palate, but not implicating uvula. It reaches upwards to site of L. posterior palatine foramen and posterior extremity of alveolus. Contiguous part of tongue rough and ulcerated. The extension of growth into pharynx uncertain, but certainly as far as lower end of L. tonsil. Growth projects well from mucous membrane, and is not yet firmly rooted. Its attachment is broad and sessile, surface lobulated and greyish. No fœtor or sloughing. No difficulty on deglutition.

(*e*) Enlarged gland at L. angle of jaw.

(*f*) May 16th.—Preliminary laryngotomy. L. cheek divided. Tongue bisected longitudinally and L. half removed with

scissors. Rest of growth chiefly removed by finger-nail. Thermo-cautery used for excision of growth from soft palate.

(*g*) Laryngeal tube removed in twenty-four hours. Nasal tube for three days. Highest temp., 18th, 101·2°.

(*h*) Relieved.

(*j*) Discharged June 1st. Readmitted July 14th—Aug. 7th, and some enlarged cervical glands removed from L. side. Again readmitted Aug. 25th—Sept. 14th, and enlarged glands removed from L. submaxillary triangle.

(*k*) It was questionable whether there was not some recurrent ulceration about the left side of the fauces when he went out in Sept.

Case 54.

(*a*) Male, 64; Mr. Jacobson.

(*b*) Two months ago pain; went to medical man, who six weeks ago noticed lumps in tongue. Has since been an out-patient of Mr. Jacobson's. The ulceration healed partly under iodide of potassium, but a nodule remained in tongue.

(*c*) An indurated mass in anterior half of L. side, one third of an inch from tip. Behind this a partially healed ulcer.

(*d*) L. submaxillary salivary, and some lymphatic glands in the same region affected.

(*e*) Mother had cancer of the uterus, which was effectually removed. Smokes a clay pipe on L. side. ? Syphilis.

(*f*) Dec. 8th.—Tongue removed by Whitehead's method. Obstinate hæmorrhage same evening from floor.

(*g*) Nutrient enemata at first. An attack of bronchitis lasting five days. Jan. 1st.—Indurated portion of submaxillary salivary gland removed, followed by a little cellulitis lasting three days. Also another slight attack of bronchitis.

(*h*) Relieved.

(*k*) On May 2nd, 1887, two enlarged lymphatic glands removed from L. side.

Case 55.

(*a*) Male, 63; Mr. Jacobson.

(*b*) Fifteen years ago a wart on middle of anterior half of tongue. Ten years ago this had attained size of a marble. Has grown rapidly last two years.

(*c*) A large whitish-yellow soft warty mass occupying middle of anterior two thirds, extending round R. border of dorsum to the under surface, but not reaching glosso-alveolar mucous membrane. Shows a slight tendency to ulcerate about its centre, where there is a deep depression. Margins overhanging. Very little surrounding infiltration. No loss of mobility. No salivation. Fœtor just commencing. No discharge or bleeding. Painless itself. Pain along R. auriculo-temporal.

(*d*) No enlarged glands.

(*e*) No ætiological factors discovered.

(*f*) Anterior two thirds of tongue removed by Whitehead's method. [The tissue of the tongue was torn with a blunt director after division of cortex, and the arteries ligatured before their division.] No ligature left in the stump.

(*g*) Patient up on the third day after the operation. Slight tendency of the stump to fall back on the day after the operation.

(*h*) Relieved.

(*k*) Registrar reported free removal of growth.

Case 56.

(*a*) Female, 21; Mr. Jacobson.

(*b*) About twelve months ago noticed a small round swelling under tip of tongue, which gradually increased in size. Caustic applied for last three months.

(*c*) Scar (due to caustic) about the size of a shilling on under surface of tongue in middle line, in front of the frænum. It forms a hard lump even when the muscles are relaxed. R. tonsil hard and ulcerated.

(*f*) Aug. 3rd.—Lower incisors extracted, and fore part of tongue excised. No particulars in the report.

(*g*) Slight hæmorrhage on Aug. 7th. Discharged Aug. 15th.

(*h*) Relieved.

(*j*) Was seen on Dec. 2nd. Speech extremely good. Ulceration completely healed. Tongue rather tied down in front, but freely movable as a whole. On the R. side is a little blue papilla, either a mucous cyst or Wharton's duct obliterated.

Case 57.

The case reported above in full.

Case 58.

(*a*) Male, 64; Mr. Symonds.

(*b*) Four months ago sore spot on R. edge. Caustic applied with no benefit, the sore continuing to spread.

(*c*) An excavated sore on anterior half of R. edge. Margin hard and everted, except at one spot, where the ulcer has burrowed. Floor warty and red. Ulcer bleeds readily. Thin discharge. Tongue bound down on L. Rest of tongue covered with white ichthyotic scales. Posterior third quite free from induration.

(*d*) No enlarged glands perceptible.

(*e*) Questionable history of syphilis.

(*f*) Aug. 20th.—Tongue excised by Whitehead's method. R. sublingual gland found to be indurated, and therefore removed. Lingual artery ligatured before its division, and consequently very little bleeding.

(*g*) Nasal tube for a week. Report incomplete. Discharged Sept. 6th.

(*h*) Relieved.

(*k*) The removed growth examined microscopically, and shown to be epitheliomatous. [Readmitted Oct. 28th. Stump healthy, but enlarged glands on R. of neck. These removed. Discharged Dec. 2nd.]

Case 59.

(*a*) Male, 59; Mr. Symonds.

(*b*) Five months ago small ulcers on L. side opposite a carious tooth; these coalesced.

(*c*) An ulcer, not larger than a shilling, at junction of middle and posterior thirds on L. side, not encroaching much on dorsum, but extending towards floor. Most of dorsum leucomatous.

(*d*) One at least beneath L. angle of jaw.

(*e*) Mother died of "bleeding cancer of the womb." Dental irritation and leucoma (*v. supra*).

(*f*) Aug. 31st.—Tongue split longitudinally with knife, and left half freed from floor with scissors. Whipcord écraseur then applied to L. half. The cord broke and caused considerable trouble and hæmorrhage.

(*g*) Nasal tube for four days. Sept. 7th.—Five glands

removed from L. submaxillary region, followed by some cellulitis and suppuration.

(*h*) Relieved.

(*j*) Discharged Sept. 19th. Wound in neck not quite healed.

Case 60.

(*a*) Male, 48; Mr. Symonds.

(*b*) Four months ago a small pimple on R. side, which grew and then ulcerated. Two months later swelling of neck, and when this subsided some enlarged glands noticed.

(*c*) Two depressed ulcerated surfaces on R. side of tongue separated by a bridge of normal tissue. Fœtor and increased salivation.

(*d*) Enlarged glands on R.

(*e*) Smokes a clay pipe.

(*f*) March 2nd.—Incision along anterior margin of R. sterno-mastoid; two growths found filled with pus; one thought not to be a suppurating gland but a cyst.

(*g*) Followed by some œdema and cellulitis for a fortnight.

(*k*) Discharged April 1st. To come up again for operation on tongue.

Case 61.

(*a*) Male, 57; Mr. Symonds.

(*b*) Twelve months ago hard pimple on L. side attributed to clay pipe; tongue also "scaly" at the time.

(*c*) Oval ulcer, more than half inch long, on L. side; surface depressed, grey, and smooth; a little rift in its upper and anterior part; edges hard. At upper and back part a little nodule. Induration extends for one eighth of an inch round. An old scar in the middle of dorsum. Tongue can be fully protruded. Pain worse at night.

(*d*) No enlarged glands mentioned.

(*e*) Irritation of a pipe and ichthyosis (?) (*v. supra*).

(*f*) Feb. 6th.—A segment of tongue removed by galvanic cautery. Hæmorrhage stopped by thermo-cautery and ligature.

(*g*) Nasal tube two days. Feb. 13th.—Some fœtor and much sloughing. 20th.—Still the same. 22nd.—Respiration 50. Wound granulating cleanly. Tongue moves freely. Sur-

face covered with a whitish slough. [Feb. 26th.—Three glands removed from below jaw. Wound quite healed March 6th.]

(*h*) Relieved.

(*j*) Discharged March 9th ; to remain under observation.

(*k*) Registrar reported that cautery went through, or at all events, very near ulcer.

Case 62.

(*a*) Male, 50 ; Mr. Symonds.

(*b*) Ten years ago first noticed tenderness of mouth and tongue. This was intermittent, he being sometimes free for a year. Six months ago a small whitish spot on tip of dorsum, and some sore spots on L. side, which he thinks are now harder. Four months ago caustic applied with no benefit.

(*c*) An undoubtedly epitheliomatous ulcer.

(*h*) Went out next day refusing operation.

1887—Case 63.

(*a*) Male, 59 ; Mr. Bryant.

(*b*) L. side of tongue fissured for "some time;" "present trouble commenced about three weeks ago, growing rapidly."

(*c*) A swelling on the middle third of the L. side, half an inch in diameter, and raised nearly half an inch. It is pale, slightly nodular, summit covered with whitish papillæ. Leukoplakia of rest of dorsum.

(*d*) No enlarged glands.

(*e*) Syphilitic history.

(*f*) Sept. 30th.—Mr. Symonds operated, removing the left half of the tongue, according to the report by Morrant Baker's method. Very little hæmorrhage. A ligature left in the stump (?) and secured over the ear. Iodoform applied freely.

(*g*) Some cough and fetid sputum for first few days. Out of bed by seventh day. Oct. 14th.—All chest trouble has disappeared. Discharged Oct. 15th.

(*h*) Relieved.

Case 64.

(*a*) Male, 71 ; Mr. Bryant.

(*b*) Tongue has been sore at intervals and in different places

for thirty-six years. Much worse during the last two years. The present sore commenced as a small ulcer.

(*c*) A mass of growth on L. side, which seems to extend from the dorsum through the tongue, appearing again on its under surface. Dorsum of tongue glazed. Enlarged papillæ at apex. Auriculo-temporal pain.

(*d*) Enlarged gland below angle of jaw.

(*e*) Commencement of the trouble attributed to smoking and drinking.

(*f*) Aug. 5th.—Half of the tongue removed, apparently with a scalpel. Vessels closed by torsion. Oozing arrested by pressure of hot sponges.

(*g*) Some hæmorrhage same evening necessitating ligature of some small vessel. Aug. 24th.—Slight renewal of hæmorrhage. Discharged with stump well healed and not painful Aug. 31st.

(*h*) Relieved.

(*k*) Registrar's report on excised portion:—"The raised papillomatous surface on dorsum (L. side) is distinctly indurated, and infiltrates the subjacent muscle by a well-marked conical process. It is white on section and has the appearance of an epithelioma. The mass on the under surface, which appeared to have a connection with that on the dorsum, was really quite distinct. A section through it showed thickening of the mucous membrane as if passing into the stage of epithelioma, but there is no definite infiltration as yet. The rough surface of L. side of tip of tongue was due to a papillomatous condition, with thickening of the mucous membrane. It may be added that these three spots were entirely separate from each other, and seemed to present gradations between simple papilloma and the definite epithelioma. The gland was not removed. The operation had gone wide of the growth."

Case 65.

(*a*) Male, 46; Mr. Bryant.

(*b*) Seven months ago irritation by teeth; has gradually got worse. Has been treated with iodide without any benefit.

(*c*) A sore on L. side of tongue, one inch diameter, occupying middle third. White, patchy appearance of dorsum noted. Mobility of tongue unimpaired. Increased salivation.

(*d*) Questionable glandular enlargement.

(*e*) Irritation by teeth (*v. supra*).

(*f*) July 12th.—Mr. Bryant removed half the tongue. Method not specified.

(*g*) Uninterrupted recovery.

(*h*) Relieved.

(*k*) Registrar reports:—"The incision had gone within one eighth of an inch of the growth posteriorly. A typical epithelioma."

Case 66.

(*a*) Male, 29; Mr. Durham.

(*b*) Side of tongue sore two months ago. An open sore for the last month.

(*c*) An ulcer, size of a shilling, at back of middle third of L. side, but induration not very marked. Several patches of leukoplakia on anterior part of dorsum.

(*d*) Some enlargement of cervical glands.

(*e*) Origin attributed to irritation by teeth.

(*f*) After a fortnight's antisyphilitic treatment, the mercury being apparently pushed to hydrargyrism, he was operated on, Jan. 21st. The growth removed by a wedge-shaped incision, and the edges of the wound approximated and sutured.

(*g*) Operation followed by subacute cervical adenitis, which rapidly subsided under treatment. Feb. 5th.—Tongue quite healed; can talk well and feels in good health.

(*h*) Relieved.

(*k*) Microscopically seen to be typical epithelioma. The patient was readmitted in March, and a recurrence in the submaxillary and cervical glands removed. Discharged April 2nd.

Case 67.

(*a*) Male, 52; Mr. Durham.

(*b*) Has often suffered from sore tongue from excessive smoking. Four months before admission, during a violent fit of coughing, something burst, filling his mouth with blood and leaving an open sore on his tongue, which has steadily become worse.

(*c*) Tongue swollen. L. side presents a ridge about an inch high, extending from opposite the second molar to the median line at the apex. To the left of this the whole of the tongue tissue has ulcerated away, and is covered with patches of yellowish white sloughs, between which may be seen little nodules of pale red tissue. Tongue more or less fixed and turned to the R. Considerable pain over hinder part of scalp and temples.

(*d*) No enlarged glands mentioned.

(*e*) Irritation from smoking. Tertiary syphilis.

(*f*) April 29th.—Laryngotomy performed. Considerable hæmorrhage, necessitating the postponement of farther operation on that day.

(*g*) Pulmonary trouble. Patient died May 4th.

(*h*) Death.

(*j*) Bronchopneumonia.

Case 68.

(*a*) Male, 50; Mr. Durham.

(*b*) R. side of tongue wounded by jagged teeth three months ago. Teeth extracted, but the ulceration extended. Six days before admission considerable hæmorrhage.

(*c*) Extensive ulceration of R. side of tongue. Immobility, profuse salivation. Pain referred to back of head.

(*d*) No enlarged glands mentioned.

(*e*) Not an excessive smoker. Irritation by teeth (*v. supra*). Phthisical family history.

(*f*) March 26th.—Preliminary laryngotomy. Cheek divided. Tongue removed with scissors.

(*g*) Fed at first with a nasal tube. Laryngotomy tube first removed April 1st. 4th.—Sloughs removed from stump of tongue. 17th.—Patient up; cheek wound all healed except at angle of mouth. Discharged April 20th.

(*h*) Relieved.

(*j*) On discharge "the whole of the cavity is seen to be lined with mucous membrane."

(*k*) On May 16th.—Came in complaining of salivation and the escape of the saliva from R. angle of mouth, where there is imperfect union. The edges were strapped into apposition. No sign of recurrence.

Case 69.

(*a*) Male, 42; Mr. Durham.

(*b*) Has suffered from sore tongue from excessive smoking. Three weeks ago suffered pain in the ear which has now brought him to the Aural Department, whence he was sent to the Surgical side.

(*c*) Deep ulceration round base of tongue from the R. molars to the L. canine. Mobility of tongue impaired. Much salivation. Auriculo-temporal pain. Some fixity of jaw, owing to enlargement of glands under angle of jaw.

(*d*) (*V. supra*).

(*e*) Irritation from smoking. Hard drinker. Syphilis.

(*f*) Calomel baths, thirty grains, daily for three weeks. May 31st.—Preliminary laryngotomy. Cheek divided. Anterior half of tongue excised with scissors. Obstinate hæmorrhage close beneath the jaw necessitated the division of the lower lip and symphysis. The floor of the mouth more thoroughly cleared, and the submaxillary gland, which was found to be invaded, removed. Jaw brought together by wiring.

(*g*) Nutrient enemata for first few days. Patient never really recovered, and died of phthisis Aug. 27th.

(*h*) Death.

(*k*) Typical epithelioma.

Case 70.

(*a*) Male, 52; Mr. Durham.

(*b*) Two years ago noticed a white spot on anterior third of his tongue, which became a "kind of pimple." Six months ago this became harder, larger, and began to ulcerate. He cauterised it with nitrate of silver.

(*c*) Epitheliomatous ulcer of middle third of L. side of tongue two inches long, and one and a quarter inches transversely. No immobility. At present no salivation, but this is said to have been marked.

(*d*) Cervical glands slightly enlarged but freely movable.

(*e*) No ætiological data, except that he used once to smoke cigars freely.

(*f*) Sept. 2nd.—Affected part removed with scissors.

(*g*) Patient recovered rapidly, and at his own request was discharged Sept. 7th. Wound clean.

(*k*) Registrar reported free removal. The growth nodular, only reaching the surface at one point.

Case 71.

(*a*) Male, 53; Mr. Howse.

(*b*) Seven months ago first noticed a swelling below the left angle of the jaw, which extended down the neck and impeded his deglutition. Seven weeks ago a similar swelling on R. side. Dyspnœa.

(*c*) Epithelioma of base of tongue and adjoining parts.

(*d*) Glandular enlargements described above.

(*e*) Inveterate smoker, also alcoholic; syphilis not mentioned.

(*f*) No operative interference justifiable.

(*h*) *Nil.*

Case 72.

(*a*) Male, 47; Mr. Davies-Colley.

(*b*) Seven weeks ago noticed soreness just behind the R. second molar tooth. Was unable to eat solids. Pain much worse for the last three weeks.

(*c*) An irregular growth at the back of his mouth on the right side involving the anterior pillar, the side and dorsum of the tongue, and the posterior extremity of the gum. It is flesh coloured, fairly well defined, has slightly raised edges, and is tender. A fissure half an inch long and a quarter of an inch deep runs across the growth antero-posteriorly. There is also a second patch outside the main one. Both are ulcerated.

(*d*) No enlarged glands detected.

(*e*) *Nil.*

(*f*) [Patient put on mercury and iodide, under which he improved markedly. Growth sponged with solution of nitrate of silver. Discharged Oct. 19th. Readmitted Dec. 8th for increased pain and fixity of jaw. Three ulcerated surfaces to be seen, of irregular shape, with smooth edges, two of them sloughy. One undermines the anterior pillar. Antisyphilitic treatment continued for a week, but condition worse. Greater difficulty in opening jaws. His cheek also became swollen. Chian terebinth and Resorcin tried.] Jan. 4th.—R. cheek divided and much of the growth scraped away. A piece of the cheek that was removed showed a hard growth with raised

and everted edges, leaving no doubt as to its epitheliomatous nature.

(*g*) Wound healed well in front, but not so well behind.

(*h*) Patient much relieved, the pain that he now suffers from being not nearly so severe as it was previously; the growth, however, soon recurred in the cheek.

(*k*) [Patient also suffered from fragilitas ossium, both femora, both forearms, several ribs, and one patella having been fractured.]

Case 73.

(*a*) Male, 48; Mr. Lucas.

(*b*) Twelve months ago soreness of tongue, much worse the last two months.

(*c*) An ulcer, size of a bean, on the R. middle third. Slightly raised, edges everted and very hard; well-marked induration of base; surface smooth and glazed. No fixation of tongue. Nocturnal salivation. Ulcer very tender, and auriculo-temporal pain.

(*d*) No enlarged glands mentioned.

(*e*) Patches of leukoplakia about tongue. Has never smoked much.

(*f*) Nov. 8th.—Needles passed through the tongue, and a piece the size of a chestnut removed by means of the galvanic écraseur. Tannic acid and iodoform applied.

(*g*) Patient up on Nov. 14th. 18th.—Granulations noted on the raw surface. 19th.—Slight hæmorrhage during the night. 20th.—Patient lost half a pint of blood during the night. The bleeding point had to be ligatured. Dec. 1st.—An ill-looking rough surface is situated at the posterior end of the wound, and the corresponding part of the gum is sore. Silver nitrate applied, and the teeth freed from accumulation of tartar. 8th.—Last lower molar (R.) extracted; the periosteum found thickened and infiltrated with epithelioma.

(*h*) Discharged 19th.

(*k*) Died Dec. 25th in the Brompton Hospital of hæmorrhage.

Case 74.

(*a*) Male, 48; Mr. Lucas.

(*b*) Six weeks ago pain in tongue, which was found to be

hard. After a week the lump began to swell and filled his mouth, rendering feeding very difficult. A week before admission the lump burst, discharging a little blood-stained pus and a core about half the size of a filbert nut.

(*c*) A foul cavity in R. middle third. Little discharge. Edges not much indurated. No pain. Mobility not much impaired. The fixity is on the right side. Some salivation.

(*d*) Submaxillary lymphatic glands enlarged.

(*e*) Syphilis negatived. Origin attributed to irritation by teeth, which are in a bad state.

(*f*) Some improvement under iodide and local applications, but nine days after admission, on Oct. 25th, the tongue was removed by Whitehead's method. A suture left in the stump, and a nasal tube passed and left in.

(*g*) Oct. 29th.—Suture removed from stump. Œsophageal tube passed when required. Good recovery, but some glandular enlargement.

(*h*) Relieved.

(*k*) The registrar gives a full report on the excised tongue with microscopical examination, which showed it to be epitheliomatous:—"The 'core' mentioned by the patient was probably the central portion of the growth which had sloughed out." Readmitted Jan. 10th, 1887, and infiltrated glands removed from neck. Wounds healed well.

Case 75.

(*a*) Male, 37; Mr. Symonds.

(*b*) Twelve months ago a small white pimple on R. anterior third.

(*c*) A small sore about the size of a sixpenny-piece, covered with small whitish nodules, hard and tender. It involves the whole thickness of the tongue. The edges of the sore are inverted and present a festooned appearance.

(*d*) No enlarged glands mentioned.

(*e*) Considerable leukoplakia. Syphilis.

(*f*) Sept. 23rd.—Half of tongue excised, the mucous membrane being divided with scissors and the tongue split mesially by the fingers. Ethereal solution of iodoform applied.

(*g*) Patient made a very good recovery, except that on the evening of Sept. 25th his temperature reached 104·4°. No

cause was found for this, and it was attributed hypothetically to iodoform poisoning, and the method of dressing altered. His temperature the next evening was 101°, and never was as high even as this subsequently.

(*h*) Relieved.

(*k*) Microscopically shown to be an epithelioma.

Case 76.

(*a*) Male, 65; Mr. Symonds.

(*b*) Eight months ago hard whitish pimple on tongue about middle. Got harder, but did not increase in size for two months. Then it broke, and after this grew rapidly.

(*c*) A broken-down mass, as large as a pigeon's egg, occupying almost all the centre of the R. half of the tongue. Edges hard and indurated. Salivation when he talks. Not much pain. There is also an epulis near second bicuspid of the lower jaw on the right side.

(*d*) Enlarged submaxillary glands.

(*e*) Syphilis.

(*f*) Oct. 25th.—Half the tongue removed by Whitehead's method. Cessation of respiration early in the operation, necessitating laryngotomy. The epulis also removed.

(*g*) Good recovery. Some sloughing about stump. No signs of recurrence. Discharged Nov. 15th.

NOTE ON TWO
CASES OF CLOT ON THE DURA MATER,
WITH COMPRESSION,
PRESENTING AN UNUSUAL DIAGNOSTIC SYMPTOM.

By C. H. GOLDING-BIRD.

I HAVE now twice seen a symptom in cases of traumatic meningeal hæmorrhage, of sufficient rarity and importance to warrant attention being specially drawn to it here; and the more so, as with the exception of a case of skull injury in which it was present, and recorded by myself in these 'Reports' for 1878, I know of no other published reference to it. In the case just referred to, a lad, æt. 14, had been admitted into the hospital for severe concussion, and was under treatment for that condition in Accident Ward for six days. There was no wound of the scalp, and it was not until the scalp was shaved, on the fifth day, that a large hæmatoma over the left parietal region was noticed. The head was known to have been bruised at that point, but only when the hair was removed was it observed that the extravasated blood was in any quantity.

On the sixth day the lad began to present symptoms of compression, which are fully detailed in the published report; yet the only paralysis observed was "a very evident diminution of resistance in the right extremities." The report goes on: "On manipulating the swelling of the scalp on the left side, and pressing on the skull at that point, the right leg and arm at once began to twitch violently, and the right hand closed convulsively, with the thumb drawn across the palm. The patient

foamed at the mouth, but there was no spasm of the facial muscles."

On operating, the swelling was, as anticipated, a pericranial hæmatoma; but no fracture of the skull could be detected. And on trephining the skull, "about midway between the anterior and posterior inferior angle of the left parietal bone, at the spot where pressure had brought on the convulsive attack," a large clot was found in the dura mater. The child after this rapidly recovered.

The second case occurred lately. The following notes are mainly from the ward report made by Mr. F. Troughton.

Thos. D—, æt. 31, admitted 22nd May, 1888, into Cornelius Ward, under Mr. Durham. At 1 p.m. he was brought in suffering from concussion; he could be made to answer questions after a fashion, relapsing at once into an irritable stupor. He had fallen from a cart an hour before; he vomited whilst being brought to the hospital. He was seen by Mr. Durham, 3—4 p.m., who diagnosed severe concussion, and gave orders for treatment in accordance with this view. Early in the evening (7 p.m.) the man became very violent, and this condition passed into downright coma soon after 8 p.m. In Mr. Durham's absence I was called to him at 10 p.m. His condition then was: complete coma, with stertor; limbs and face paralysed; limb-reflexes absent; pupils inactive and dilated, the left one more so than the right; and the left side of the face appeared slightly more paralysed than the right. Pulse 116, temp. 102·8°. There was no wound, nor had he bled from nose or ear; but over the right parietal region the scalp was bruised, and puffy with extravasated blood. Nothing indicative of fracture of the skull, with displacement, could be felt. On making firm digital pressure over the bruised scalp, anterior to the right parietal eminence, sudden extension movements were produced of the left forearm and wrist. On repeating the pressure the movements were always reproduced; by pressing still more firmly not only did these movements occur but convulsive ones affecting the left arm and both legs.

The diagnosis of clot on the right dura mater, together with severe brain laceration, was therefore made; and though the case was as nearly as possible hopeless, it was decided to give the patient the chance offered by operation.

I operated, without anæsthetic, on the right side; there was bruising and pericranial hæmatoma, but the skull was firm and appeared unbroken. I trephined just anterior to the parietal protuberance, and before the disc of bone was removed blood began to ooze up through the trephine cut. On elevating the circle of bone a clot was found. The opening was now considerably enlarged, both upwards and backwards, to the extent of about two by one and a quarter inches, by Hoffmann's forceps, and a simple short fissure was found running nearly horizontally backwards. The clot covered an area over two inches square, and extended under the occipital bone, from which place it was scooped out. All the clot was removed.

The dura mater now bulged into the opening in the bone considerably; it was tentatively incised, and a stream of dark blood immediately shot out to the height of half an inch, and then ceased. Bruised brain matter filled up the cut in the dura mater.

The only observable alteration in the patient's condition, as the result of the operation, was that his breathing improved slightly. Prior to it the stertor was extreme, and the rhythm every now and then of Cheyne-Stokes' character. He died two to three hours afterwards.

Post-mortem.—No fracture of skull anywhere (what there was was removed at the operation with the bone). There were three and a half ounces of clot in the arachnoid cavity, chiefly on the left side, and much bruising of anterior and under surfaces of left temporo-sphenoidal lobe from *contre-coup*.

In both these cases there are important points in common, but the one special symptom that proved of the greatest value in each, was the fact of movement on the opposite side of the body being evoked by digital pressure over the parietal area of the injured side. This would not be strange had there been in either case extensive injury to the parietal bone; so that it could, as we see sometimes, be moved *en masse;* or had there been a depressed fracture of any kind. But in each case the skull was apparently uninjured. In the case of the boy no fracture was detected at all; in the man's case a fracture was found when enlarging the trephine opening; for on removing a piece of bone, nipped off with Hoffmann's forceps, not only

did the small semicircle come away, but owing to incomplete cutting by the forceps there came away with it, without any employment of force, an attached portion of bone about an inch long, and bounded on one side by the sharp-cut line of a fissure; it could not have been a suture edge, both from its appearance and from the fact that it was not in the line of a suture.

In both these cases blood was effused in the deep scalp tissues, and the only rational explanation of the symptom is that the pressure of the hand in the examination of the bruise drove some of the blood through a fissure in the skull into its interior, and thus communicated the pressure to the intra-cranial clot and so to the brain; in fact it was a hydrostatic, or hæmostatic, bellows experiment that was unintentionally performed. I can only suppose that in the boy's case there must have been a fissure that had been overlooked, unless the original injury had been severe enough to loosen a sutural junction; but beyond the fact of the boy's prolonged state of concussion there is nothing in the report of the case to suggest such severe bone injury.

The practical deduction from these two cases would seem to be:—Given a case of head injury with compression, and scalp bruising on one side *without apparent injury to the skull;* if digital pressure over the bruised area causes movement on the opposite side, then there is probably a fissured skull, and certainly a clot on the dura mater beneath; and that by trephining at that spot life may be saved.

STATISTICS OF SECONDARY HÆMORRHAGE AFTER AMPUTATION

WITH STATISTICS OF AMPUTATIONS AT GUY'S HOSPITAL FOR FORTY-TWO YEARS.

By JOHN POLAND.

Seeing that no detailed or complete statistical report of secondary hæmorrhage after amputations has recently been published, it appeared that a record of the cases which have occurred at Guy's Hospital during the years 1877—1886 might be worth publication in the 'Reports,' in addition to those already reported for 1867—1876 inclusive. Both these series of figures differ very considerably from those given heretofore by different observers. Thus Mr. Callender, in vol. xlvii of the 'Med.-Chir. Trans.,' "On Amputations performed at St. Bartholomew's Hospital during the years 1853—1863," gives the following among the chief causes of 74 deaths after 358 amputations; 6 cases of death from secondary hæmorrhage. Of the primary amputations, 1 death from secondary hæmorrhage in a thigh amputation; of the secondary, 1 death from this cause in an arm, 1 in a thigh, and 1 in a leg amputation. Of all other amputations, 1 death in a thigh and 1 in a leg amputation. The rate of mortality from secondary hæmorrhage in the total of fatal cases he found to be: For primary amputations, 1 case in a total of 15 deaths; for secondary amputations, 3 cases in 13 deaths (or 1 in 4·3), 23 per cent.; for all other amputations, 2 cases in 46 deaths (or 1 in 23). Of the total 74 fatal cases 8·1

per cent. died from secondary hæmorrhage. In his total figures of deaths from hæmorrhage Mr. Callender included 3 cases of death from recurrent hæmorrhage, which brought up the percentage to 12·1 deaths from hæmorrhage.

Also Mr. Bryant, in vol. xlii of the 'Transactions' of the same society, published a paper on the causes of death after amputation, with a statistical account of 300 amputation cases from 1845—1859. Of a total of 76 fatal cases there were: Among—

Primary amputations, 1 case of secondary hæmorrhage from the thigh (9 per cent.), and 1 case of secondary hæmorrhage from the arm (50 per cent.).

Secondary amputations, 1 case of secondary hæmorrhage from the leg (12·5 per cent.)

Pathological amputations, 1 case of secondary hæmorrhage from the thigh (5·5 per cent.); 1 case of secondary hæmorrhage from the leg (33·3 per cent.)

Of the total amputations of the thigh (2 cases), 5 per cent.; leg (2 cases), 7 per cent.; arm (1 case), 33·3 per cent.

Of primary amputations (2 cases), 7 per cent. of fatal cases.
Of secondary „ (1 case), 8·3 „ „ „
Of pathological „ (2 cases), 9·5 „ „ „

Making a total of 7 per cent. of fatal cases, or 1·66 per cent. for the whole number of amputations. Five deaths from traumatic complications were excluded in the calculation of these percentages.

Percentage of deaths from secondary hæmorrhage in the total for the different amputations:

Thigh.			Leg.			Arm.	Total.			
Pathological.	Primary.	Total.	Pathological.	Secondary.	Total.	Total.	Pathological.	Primary.	Secondary.	Total.
1	5	1·4	2·5	8	2·4	3	1·4	2·6	4	1·66

Again, in vol. iii (1870) of the Clinical Society's 'Transactions,' Mr. Callender, in a "Note on Cases of Amputation in which Ligatures have been used," remarks, in the first place with reference to secondary hæmorrhage, that he had elsewhere published the results of 358 amputations performed at St. Bartholomew's Hospital.[1] Of this number 74 died, and of these 5 died from secondary bleeding; a sixth case

[1] 'Med.-Chir. Trans.,' vol. xlvii.

was reported as dying from purpura and blood-oozing. These cases extended over a period of eleven years, from January, 1853, to October, 1863. The following figures showed the results of amputations at St. Bartholomew's Hospital from January 1st, 1869, to January 1st, 1870. Total number of cases 46. Total number of deaths 7, or 1 in every 6·5 died, or 15·2 in every 100. No cases of secondary hæmorrhage. Adding to the first-named 358 cases the amputations referred to below, and which had been treated since October, 1863, he had 480 operations with 6 deaths from secondary hæmorrhage, or 1 in 80, or 1·2 in 100. In the personal experience of Mr. Paget and Mr. Callender, only twice had secondary bleeding occurred out of 108 cases. Of the 2 cases, in 1 it was predicted on account of the excessively tight application of the ligature. The ligature cut through the femoral artery and there was severe bleeding on the fifth day. In the second case the patient recovered after ligature of the common femoral. He therefore considered himself justified in stating that secondary bleeding was a comparatively rare occurrence after tying main arteries.

Such figures as these, taken from one surgeon's practice, and ranging over so short a period, cannot but be misleading. In the practice of the whole surgical staff of Guy's Hospital during the two years 1878, 1879 there were no cases of secondary hæmorrhage, either fatal, severe, or slight.

Now, in all the figures just quoted, and in those of which the writer has been able to avail himself, no calculation, and but a passing mention, is made of cases of secondary hæmorrhage from amputation wounds, which are treated and ultimately recover. Yet it cannot be doubted that these too in their clinical aspect should be taken into consideration if we wish to trace its causation. It is true, as will be seen by the Tables accompanying this paper, that death from secondary hæmorrhage is of the greatest rarity at the present time, and unquestionably this diminution in frequency is largely due to the advances gained in the antiseptic treatment of wounds. Thus, out of the 641 amputations during the ten years 1877—1886, there were 6 in which death resulted from this cause, but absolutely 5, for in one, although this took place from exhaustion and suppuration four months after

the date of the operation, yet repeated bleeding contributed in great measure to the fatal result. Taking the 6 we get a percentage of ·93, or 1 in 106·7, for all amputations; if the 5, ·78 per cent., or 1 in 128·2. In the same way Mr. Bryant's figures yield 1·66 per cent. Comparing the rate of mortality from secondary hæmorrhage in the total of 143 fatal cases we find a percentage of 4·1 instead of 7·04 given by Mr. Bryant, and almost exactly one half of that by Mr. Callender.

Turning to the cases of secondary hæmorrhage, many of which were slight, and all ending in recovery, we find there were 10 in 498 cases of recovery, a percentage of 2·008, or 1 in 49·8.

By adding these two series together there is a total of 16 in 641 amputations, or a percentage of 2·6.

An examination of these Tables shows that out of 168 *primary* amputations there were 3 cases of slight bleeding, 1·7 per cent. for the whole number, but no deaths from this cause. Out of 77 *secondary* amputations there were 2 cases, one of which was fatal, making a percentage of 2·4 for the whole, and 1·2 of fatal cases for the whole number, and a percentage of 3·5 in the total fatal cases in this division. Out of 334 *pathological* amputations there were 10 cases, 4 of which were the cause of death, making a percentage of 2·9 for the whole, and a percentage of 1·1 of fatal cases for the whole number, and a percentage of 6·06 for total fatal cases in this division. Out of 62 cases of *expediency* there was one fatal case, making a percentage of 1·6 for the whole, and a percentage of 14·2 fatal cases out of the total fatal cases.

This second decade of cases might be compared with the first (1867—1876) previously published in the 'Lancet,' 1878, and quoted by Mr. Clement Lucas in vol. xxiv (1879) of the 'Guy's Hospital Reports.' Out of 543 amputations there was a total of 27 cases of secondary hæmorrhage recoverable and fatal, or a percentage of 4·9 for total number of cases. Although this appears so high, it may be accounted for partly by the local treatment of the vessels, *e. g.* acupressure, partly by that of the wounds themselves. These figures will be alluded to presently.

The *etiology* of secondary hæmorrhage is a point of considerable interest. Like many other diseases, whose cause is a matter of speculation, the condition which gives rise to its production is apparently due to many factors, and it should be determined as far as possible what each of these may be, and their exact comparative value. A critical examination of every case, whether slight, severe, or fatal, must therefore be of the greatest importance, and consequently we should not be content in recording, as others have done, only those in which death has been a direct result. It is evident that the latter furnish us pathologically with the most trustworthy data, yet final conclusions cannot be drawn from them.

Among *local* causes, it will be found that some arteries are more frequently affected than others; of these the femoral artery must be placed first. In the subjoined Tables, out of a total of 16 cases of secondary hæmorrhage there are 11 from the femoral artery (thigh 9, hip 2), a percentage of 68·7; 3 of the popliteal, a percentage of 18·7; 1 of the forearm and 1 of the foot. And in the Tables for 1867—76, out of 27 cases 13 were from the femoral, a percentage of 48·1. Adding the two periods together (twenty years), out of a total of 43 cases 55·8 per cent. were of the femoral artery, and out of the total 239 amputations of the thigh and hip (1877—1886) secondary hæmorrhage ensued in 4·6 per cent. Out of the total 6 deaths from secondary hæmorrhage in the same period, 5 were from the femoral, making a percentage of 2·09 deaths from secondary hæmorrhage in the total of these amputations. The sixth case of death was from the popliteal artery.

Secondary bleeding does not appear to be dependent to any great extent upon the present modes of occlusion of the vessels. In the Tables for 1867—76,[1] out of 543 amputations, 73 dying within the first few days were excluded; in 64 cases the silk ligature was employed and followed by secondary hæmorrhage in 5 cases, 1 in every 12·8, or 7·812 per cent.; in 19 cases of acupressure secondary hæmorrhage followed in 6 cases, 1 in 3·1 cases, or 32·6 per cent.; in 355 of torsion secondary hæmorrhage occurred in 14 cases, 1 in

[1] 'Guy's Hospital Reports,' series 3, vol. xxiv.

25·3, or 3·66 per cent.; in 31 cases of carbolized catgut ligature, 2 cases occurred, 1 in 15·5 or 6·45 per cent. However, in analysing the cases for 1877—1886, secondary bleeding was found to occur as much after one form of occlusion as the other, provided a septic ligature was not employed.

Undoubtedly, an extensive sloughy condition of the wound was formerly a fertile source of hæmorrhage—and even now an unhealthy process going on in it is to be regarded as the most important factor of all, notwithstanding that every effort may have been made to obtain asepsis in the wound. This was the case in two of those given in the accompanying Tables.

Arteries appear to be unable to resist, as they do some other forms of infection, the influence of this unhealthy process, which sets up in their coats a form of suppurative arteritis. In the Pathological Society's 'Transactions,'[1] Mr. Symonds gives a good description of this condition and drawings of the microscopical appearance of the changes in the vessel, from "a case of aneurysmal dilatation of the radial artery with suppurative arteritis."

This cannot always be a purely local condition, but is frequently associated with, or secondary to, a general state of the system, probably septicæmic in many cases. Indeed, Dr. B. A. Watson, of Philadelphia, is of opinion that all cases of secondary hæmorrhage are due to septic infection, and writes:[2] "I employ the term secondary hæmorrhage with especial reference to the fact that it is always to be regarded as a secondary wound complication, while septic infection is the primary."

The view that the closure of blood-vessels depends more on healthy plastic inflammation than on the formation of the clot, is borne out by the experiments of Messrs. Ballance and Edmunds,[3] "on the ligation of the larger arteries in their continuity." As Ziegler states, the lining of the blood-vessels is analogous to that of serous cavities, and a general

[1] 'Path. Soc. Trans.,' vol. xxxv, 1884, p. 146.

[2] 'On Amputations of the Extremities and their Complications,' Edinburgh edition, 1885, p. 533.

[3] 'Med.-Chir. Trans.,' vol. lxix, p. 443.

condition (of cachexia) must, therefore, considerably alter what should be healthy plastic inflammation. This explains the frequency with which we find, in patients who have died from other causes, the ends of the vessels in their stumps firmly healed, and the reparative process complete, yet but little clot present, and often at the same time a collateral branch immediately above the occluded end. This anatomical state of the vessels can, therefore, have but little influence in causing secondary hæmorrhage, provided that other conditions are equal and plastic inflammation present.

It is interesting to note the large proportion of cases following amputation for disease, 11 out of 16 cases; and of the 6 deaths from this, all except 1 were in this division. Only 3 after primary and 2 after secondary amputations; death in 1 of the latter.

As to *age*, this ranged from 15 to 61 years; a large majority, 10 out of the 16, occurred between 20 and 36 years.

From the post-mortem records calcareous arteries do not appear to predispose to secondary hæmorrhage, neither does visceral disease to the extent that is generally supposed. Of the 5 fatal cases in which the post-mortem condition is given, it is carefully noted in 4 that all the viscera were healthy. In the fifth, Case 12, in which the patient succumbed four months after the amputation from repeated hæmorrhage and exhaustion, there were lardaceous viscera and some evidence of syphilis. Syphilitic arteritis is responsible for a certain number of cases. In Case 2, in which the patient recovered, an aneurysm had developed after amputation at the knee-joint for compound fracture of the leg, taking place at the site of long-standing syphilitic necrosis of the tibia.

The following are the post-mortem notes of 5 of the fatal cases, of the sixth (Case 8), unfortunately no post-mortem examination was made.

Case 4. *Secondary hæmorrhage from popliteal artery on thirty-third day after secondary amputation at the knee-joint (on nineteenth day) for compound fracture of tibia and fibula.*

—Tetanus. Suppuration and ulceration of popliteal artery. Death on thirty-third day. Patient æt. 30.

The stump at the right knee-joint presented on either side an almost level granulating surface, from one of which there ran an abscess up the anterior aspect of the femur, containing about 8 oz. of bad-smelling pus, and on the posterior aspect another granulating surface, running vertically up the posterior flap and ending in a sinus at its upper limit, connected with a small abscess cavity in the position of the end of the popliteal artery. From this sinus a good-sized stream flowed when water was injected by means of a syringe into the common iliac artery. The walls of the abscess cavity were composed of soft, flocculent, shreddy slough, and there was an entire absence of granulation tissue. About the centre of this abscess the twisted end of the popliteal artery lay, and presented a most interesting condition. Suppuration had taken place between its middle and inner coats (see Plate), and passed upwards in such a manner as to completely separate the two for a distance of two inches. The internal coat thus lay like a cast in the lumen of the vessel, and looked at first sight not unlike a coagulum. The upper part of this inner coat was thin and papery, and at its extreme upper limit of separation from the outer coats fairly abrupt and well defined. The lower three quarters of an inch shaggy, thickened, soft, and sloughy, lay loose in the abscess cavity. This tube-like inner coat presented an opening into the lumen of the vessel above, and for a distance of one eighth of an inch contained the remains of some broken-up adherent coagulum. It was from the lower orifice of this that the fatal hæmorrhage had taken place. Corresponding to the whole length of this suppuration in the tunics the external coats were found to be thickened by inflammatory material to double their normal size, and this condition extended upwards for a quarter of an inch above the upper limit of separation of the coats. Above this, all the arterial coats appeared to be healthy. Below, the thickened coats became continuous with the lining of the abscess cavity and blended imperceptibly with it. The femoral vein was plugged for a distance of five inches with adherent clot. The suppuration

around the popliteal artery had no ascertainable connection with the suppuration extending up the front of the thigh. All the organs were healthy.

Case 7. *Secondary hæmorrhage on fifteenth and twenty-first days after amputation of the thigh for osteo-myelitis of femur with abscess of thigh and sinuses.*—Ligature of femoral artery on fifteenth day. Death on twenty-first day from secondary hæmorrhage from the profunda vein. Patient æt. 16. The following are Dr. Goodhart's notes:

"The stump of the thigh was gaping widely, and looked dry and actionless. The wound in the thigh for ligature of the femoral artery in the same way, though between four and five days old, looked so like a post-mortem wound that I asked if anyone had been tying the artery post mortem, not knowing at the time the nature of the case. The gut ligatures on the vessels, of which I counted three sets, one on the femoral, another bunch on the inner side of the stump in the neighbourhood of large branches of the internal circumflex, and some near the bone; they were are all tough still and rather rigid, showing, that is to say, very little tendency to absorption, and ? indicating an absence of reparative action in the wound. The bleeding seemed to have come from the internal circumflex branches, but the settlement of the point was reserved for further examination. All the parts were removed, with the adjacent parts of the pelvis and hip-joint. There was no disease of the other joints or bones. Lungs quite bloodless, healthy; no ecchymosis or evidence of any septic state. Heart-muscle pale but not distinctly fatty. Liver rather fatty. Rest of viscera healthy but bloodless."

"I made a careful examination of the stump subsequently, and found a good deal of suppuration running up the inner side of the stump. The arteries were quite closed, but a large branch of the profunda vein had been ulcerated into and was lying open at the bottom of the flaps in the adductor region of the thigh."

Case 12. *Amputation of the thigh for extensive suppuration following osteotomy for ankylosis of hip. Frequent hæmor-*

rhage. Gradual exhaustion.—Early lardaceous viscera. Thrombosis of iliacs, femorals, and inferior vena cava. Patient æt. 20. The following are from Dr. Goodhart's notes:

"Stump close to hip, with sinuses and burrowing abscesses, one of which ran up into the pelvis along the iliacus. Flaps well united round the bone, and there was a good deal of repair. The granulation-tissue, though, did not look healthy, it was caseous-looking when the flaps were forcibly separated. Extensive old thrombosis up to the origin of the renals and a transverse section of the cava below this showed it to be contracted, its coats thickened, and its canal entirely occluded by a flaccid, greenish organised material, in the centre of which were two small sinuses with cavernous walls, as if the clot had softened here. The iliacs were also plugged, and the left, which was examined more particularly, showed its canal occupied by an organised material. The arteries were closed, aortic vessels healthy. All the viscera were lardaceous."

Case 13. *Severe secondary hæmorrhage on seventh day after amputation of the thigh for disorganisation of the knee-joint of two years' duration.*—Ligature of femoral artery. Death. Local arteritis. Patient æt. 53. The following notes are by Dr. Carrington:

"Amputation flaps sloughy and unhealthy looking, and their surfaces not granulating. The left femoral artery was diseased for a distance of four inches above the twisted end; it was thickened, dilated, and corrugated. It appeared as though a local arteritis had started from about the diseased joint. The artery was found to be ligatured and quite empty of clot. The other arteries in the body were in good condition. No pus in joints. Heart-muscle pale, otherwise healthy. Kidneys and other viscera healthy."

Case 16. *Secondary hæmorrhage on sixteenth and eighteenth days after amputation at the hip-joint for sarcoma of thigh.*—Burrowing of pus upwards. Pyæmia. Death eighteenth day. Purulent phlebitis. High origin of profunda and ulceration. Patient æt. 21. The following are Dr. Goodhart's notes:

"Pus burrowed about the floor of the wound in all directions, especially round the main vessels; at the outer side of these an abscess ran up into the pelvis and under Poupart's ligament. The cavity contained recent blood-clot, and it was evident the hæmorrhage was from here; and on examining the vessels the superficial and deep femoral were found to come off together under Poupart's ligament, and, after coursing an inch or so downwards, the profunda opened straight into the abscess sac. The direction of the artery opened was rather that of the external circumflex, but since the profunda itself could not be traced beyond its abruptly opened end, it seems that the sloughing had led to ulceration of the vessel at its point of splitting into its branches, for it was not known to have been touched at the operation. The femoral artery contained clot for half an inch or so below Poupart's ligament above where it had been twisted, but the clot was soft and pus-like, and by no means safe. The femoral and external iliac veins, also branches of the internal iliac, were full of thick greenish pus, and the profunda vein opened also into the abscess sac, but its contents were pus; several veins running about the groin contained pus. Pyæmic abscesses in lungs. Kidneys and all viscera healthy. All joints healthy. It was thought he had died from the hæmorrhage, but with abscesses in the lungs to the amount he had the end could only have been hastened."

Amputations.

The subjoined statistical Tables of amputations for twelve years (1875—1886) form partly a continuation of those published in the 'Guy's Hospital Reports,' series iii, vol. xxi, 1876, for fifteen years (1860—1874), 559 cases, and partly a continuation of those given by Mr. Bryant in the 'Med. Chir. Trans.,' vol. xlii (1845—1859) for fifteen years, 300 cases; all of which, if taken together, comprise a continuous period of forty-two years with a total of 1641 amputations. The Tables for the twelve years (1875—1886) record, like the others, all cases treated by the surgeons of Guy's Hospital during that period, amounting to 782 cases. These have been arranged

for comparison, like those given by Mr. Golding-Bird, in three periods of life, before 20, between 20 and 40, and over 40 years of age, and Tables combining the years 1860—1886 for these three periods have been added.

The figures throughout these Tables[1] show a marked diminution in the rate of mortality as compared with that given by Mr. Golding-Bird, certainly due to the more careful dressing of wounds. This diminished death-rate is most marked on comparing the total results of twelve years (1875—1886) with the preceding fifteen years. Here in the total 782 cases the death-rate for all ages is 23·6 per cent., or 1 in 4·2, and that for 559 cases (1860—1874) 35·4 per cent., or 1 in 2·8.

1875—1886.		1860—1874.	
Primary amputations	25·4 per cent.	Primary amputations	43·2 per cent.
Secondary „	40·4 „	Secondary „	58·5 „
Pathological „	20·6 „	Pathological „	26·7 „
Expediency „	12·8 „	Expediency „	25·3 „

Taking the three different periods of life:

Up to 20 *years of age.*

1875—1886.		1860—1874.	
Total death-rate 16·7 per cent. or 1 in 5·9.		Total death-rate 21·4 per cent. or 1 in 4.	
Primary amputations	17·1 per cent.	Primary amputations	15·3 per cent.
Secondary „	31·2 „	Secondary „	50· „
Pathological „	16·2 „	Pathological „	16·04 „
Expediency „	7·6 „	Expediency „	35· „

21—40 *years of age.*

1875—1886.		1860—1874.	
Total death-rate 19·6 per cent. or 1 in 5·09.		Total death-rate 34·9 per cent. or 1 in 2·8.	
Primary amputations	17·4 per cent.	Primary amputations	39·7 per cent.
Secondary „	37·03 „	Secondary „	44·4 „
Pathological „	18·3 „	Pathological „	32·6 „
Expediency „	12· „	Expediency „	22·2 „

[1] For the purpose of analysis the usual classification of amputations has been made by the terms: Primary, for those of accident before the first twenty-four hours, and Secondary, for those after that period; Pathological, those for disease, and amputations of expediency, as given by Mr. Bryant, those for tumours, deformities, and other conditions of a similar character. Amputations at the knee are placed under those of the leg, wrist and elbow under forearm.

Over 40 years of age.

1875—1886.		1860—1874.	
Total death-rate 36·5 per cent. or 1 in 2·7.		Total death-rate 47·8 per cent. or 1 in 2·09.	
Primary amputations	42·4 per cent.	Primary amputations	66· per cent.
Secondary „	45·09 „	Secondary „	75·8 „
Pathological „	31·4 „	Pathological „	30·5 „
Expediency „	21·05 „	Expediency „	20·8 „

For the twenty-seven years between 20 and 40 years of age there is a percentage of 27·2 for all amputations compared with 18·2 per cent. before 20 years, and of primary amputations between 20 and 40 years of age, a percentage of 29·007 compared with 17·2 per cent. before 20 years.

These figures illustrate well the influence of age on the death-rate, and maintain the accuracy of the observations of Sir James Paget on the periods of life favorable to surgical operations;[1] also of Holmes, Spence, Malgaigne, and other writers.

As to the different forms of amputation:

	1875—1886.	1845—1874.	1845—1886.
Amputation—Hip . .	54·5 per cent.	... ...	... 54·5 per cent.
„ Thigh .	29·1 „	... 35·6 per cent.	... 32·9 „
„ Leg . .	25·3 „	... 35·7 „	... 31·3 „
„ Foot . .	6·6 „	... 9·3 „	... 7·1 „
„ Shoulder	50· „	... 36· „	... 44·4 „
„ Arm . .	24·7 „	... 26·3 „	... 25·5 „
„ Forearm	1·7 „	... 16·7 „	... 10·5 „

Of the total traumatic cases (1875—1886), out of 214 cases 92 died, or 30·06 per cent. compared with 47·8 per cent. for 1860—1874. Taking the same cases for the forty-two years there are 640 cases and 249 deaths, giving a percentage of 38·9 or 1 in 2·5.

In the same period (1875—1886) out of 23 primary *double* amputations 11 recovered, and the ages extended between 8 and 63 years. Of the 12 deaths 4 were after amputation of both thighs between 17 and 45 years of age, 4 of amputation of both legs between 20 and 63 years of age, 1 of the leg and forearm at 16, 1 of the leg and forearm at 43, 1 of both arms at 35, 1 of thigh and leg at 42 years

[1] 'Clinical Lectures and Essays,' 1885.

of age. Of the recoveries 4 were of both legs between 8 and 46, 1 of both thighs at 18, 1 of thigh and forearm at 19, 1 of shoulder and knee at 19, 1 of leg and foot at 28, 1 of arm and forearm at 33, 1 of foot and leg at 19, and 1 of both feet at 35 years of age.

Of 14 *re-amputations* for painful, conical, or ulcerative condition of the stump ranging between 9 and 46 years of age, 8 were of the thigh, 5 of the leg, and 1 of the arm, all terminating in recovery.

The rate of mortality for the total 1641 cases (1845—1886) for all ages is 27·9 per cent., or 1 in 3·5.

Primary amputations . .	34·9 per cent.
Secondary „ . . .	48·4 „
Pathological „ . . .	20·9 „
Expediency „ . . .	21·2 „

Of these (1845—1886) traumatic cases there were:

Amputation—Thigh	(154 cases) .	51·9 per cent.	deaths.
„ Leg	(239 cases) .	45·6 „	„
„ Foot	(31 cases) .	9·6 „	„
„ Shoulder	(22 cases)	45·4 „	„
„ Arm	(118 cases) .	31·3 „	„
„ Forearm	(76 cases)	13·1 „	„

Statistics of amputations at St. Bartholomew's Hospital in periods of ten years are given by the surgical registrars in vol. xi (1875), vol. xviii (1882), vol. xx (1884), vol. xxviii (1887), and in statistical Tables (for 1875—1884) of 'St. Bartholomew's Hospital Reports.'

TABLE I.—*Amputations. For* 42 *years* (1845—1886), *all ages.*

	Primary			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	12	14	53·8 or 1 in 1·8	3	4	57·1 or 1 in 1·7	15	18	33	54·5 or 1 in 1·8
Thigh . . .	55	43	43·8 or 1 in 2·2	19	37	66·07 or 1 in 1·5	301	112	27·1 or 1 in 3·6	50	17	25·3 or 1 in 3·9	425	209	634	32·9 or 1 in 3·03
Leg . . .	91	75	45·1 or 1 in 2·2	39	34	46·5 or 1 in 2·1	154	29	15·8 or 1 in 6·3	40	10	20 or 1 in 5	324	148	472	31·3 or 1 in 3·1
Foot . . .	18	2	10 or 1 in 10	10	1	9·09 or 1 in 11	100	7	6·5 or 1 in 15·2	14	1	6·6 or 1 in 14	142	11	153	7·1 or 1 in 12·9
Shoulder . .	12	7	36·8 or 1 in 2·7	...	3	100 or 1 in 1	1	1	50 or 1 in 2	2	1	33·3 or 1 in 3	15	12	27	44·4 or 1 in 1·2
Arm . . .	62	25	28·7 or 1 in 3·4	19	12	37·5 or 1 in 3·08	38	6	13·6 or 1 in 7·3	15	3	16·6 or 1 in 6	134	46	180	25·5 or 1 in 2·9
Forearm . .	56	6	9·6 or 1 in 10·3	10	4	28·5 or 1 in 3·5	48	4	7·6 or 1 in 13	13	1	7·1 or 1 in 14	127	15	142	10·5 or 1 in 8·4
Total . . .	294	158	34·9 or 1 in 2·8	97	91	48·4 or 1 in 2·06	654	173	20·9 or 1 in 4·7	137	37	21·2 or 1 in 4·7	1182	459	1641	27·9 or 1 in 3·5

TABLE II.—*Amputations. For 27 years* (1860—1886), *all ages.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Re-covered.	Died.	Per cent.	Re-covered.	Died.	Per cent.	Re-covered.	Died.	Per cent.	Re-covered.	Died.	Per cent.	Re-covered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	12	14	53·8 or 1 in 1·8	3	4	57·1 or 1 in 1·7	15	18	33	54·5 or 1 in 1·8
Thigh . . .	47	31	39·7 or 1 in 2·5	18	34	65·3 or 1 in 1·5	219	94	30·03 or 1 in 3·3	37	11	22·9 or 1 in 4·3	321	170	491	34·6 or 1 in 2·8
Leg . . .	82	60	42·2 or 1 in 2·3	35	26	42·6 or 1 in 2·3	118	26	18·05 or 1 in 5·5	38	6	13·6 or 1 in 7·3	273	118	391	30·1 or 1 in 3·3
Foot . . .	17	2	10·5 or 1 in 9·5	10	1	9·09 or 1 in 11	95	7	6·8 or 1 in 14·5	14	1	6·6 or 1 in 15	136	11	147	7·4 or 1 in 13·3
Shoulder . .	10	7	41·1 or 1 in 2·4	...	3	100 or 1 in 1	1	1	50 or 1 in 2	1	1	50 or 1 in 2	12	12	24	50 or 1 in 2
Arm . . .	52	22	29·7 or 1 in 3·3	15	11	42·3 or 1 in 2·3	28	6	17·6 or 1 in 5·6	12	3	20 or 1 in 5	107	42	149	28·1 or 1 in 3·3
Forearm . .	43	3	6·5 or 1 in 15·3	7	4	36·3 or 1 in 2·7	35	4	10·2 or 1 in 9·7	9	1	10 or 1 in 10	94	12	106	11·3 or 1 in 8·8
Total . . .	251	125	33·2 or 1 in 3·008	85	79	48·1 or 1 in 2·1	508	152	23·03 or 1 in 4·3	114	27	19·1 or 1 in 5·2	958	383	1341	28·5 or 1 in 3·5

TABLE III.—*Amputations. For 27 years (1860—1886), over 40 years of age.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	1	...	...	...	1	100 or 1 in 1	1	1	2	50 or 1 in 2
Thigh . . .	14	13	48·1 or 1 in 2·07	5	16	76·1 or 1 in 1·3	38	25	39·6 or 1 in 2·5	9	2	18·1 or 1 in 5·5	66	56	122	45·9 or 1 in 2·1
Leg . . .	23	37	61·6 or 1 in 1·6	15	19	55·8 or 1 in 1·7	31	18	36·7 or 1 in 2·7	15	3	16·6 or 1 in 6	84	77	161	47·8 or 1 in 2·09
Foot . . .	4	...	...	8	1	11·1 or 1 in 9	22	6	21·4 or 1 in 4·6	1	1	50 or 1 in 2	35	8	43	18·6 or 1 in 5·3
Shoulder . .	4	3	42·5 or 1 in 2·3	...	2	100 or 1 in 1	1	...	...	...	...	...	5	5	10	50 or 1 in 2
Arm . . .	9	13	59·09 or 1 in 1·6	6	6	50 or 1 in 2	8	4	33·3 or 1 in 3	5	2	28·5 or 1 in 2·5	28	25	53	47·1 or 1 in 2·1
Forearm . .	3	...	...	1	1	50 or 1 in 2	21	2	8·6 or 1 in 11·5	4	...	...	29	3	32	9·3 or 1 in 10·6
Total . . .	57	66	53·6 or 1 in 1·8	35	45	56·2 or 1 in 1·7	122	55	31·07 or 1 in 3·2	34	9	20·9 or 1 in 4·9	248	175	423	41·3 or 1 in 2·4

TABLE IV.—*Amputations. For 27 years* (1860—1886), 21—40 *years of age inclusive.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	2	4	66·6 or 1 in 1·5	1	3	75 or 1 in 1·3	3	7	10	70 or 1 in 4
Thigh . . .	16	9	36 or 1 in 2·7	10	13	56·5 or 1 in 1·7	65	41	38·6 or 1 in 2·5	14	4	22·2 or 1 in 4·5	105	67	172	38·9 or 1 in 2·5
Leg . . .	32	17	34·6 or 1 in 2·8	13	6	31·5 or 1 in 3·1	37	4	9·7 or 1 in 10·2	12	1	7·6 or 1 in 13	94	28	122	22·9 or 1 in 4·3
Foot . . .	6	2	25 or 1 in 4	2	...	...	34	...	...	8	...	...	50	2	52	3·8 or 1 in 26
Shoulder . .	...	2	100 or 1 in 1	...	...	...	...	...	...	1	...	...	1	2	3	66·6 or 1 in 1·5
Arm . . .	18	5	21·7 or 1 in 4·6	5	2	28·5 or 1 in 3·5	13	2	13·3 or 1 in 7·5	3	1	25 or 1 in 4	39	10	49	20·4 or 1 in 4·9
Forearm . .	21	3	12·5 or 1 in 8	2	1	33·3 or 1 in 3	6	2	25 or 1 in 4	4	...	...	33	6	39	15·3 or 1 in 6·5
Total . . .	93	38	29·007 or 1 in 3·4	32	22	40·7 or 1 in 2·4	157	53	25·2 or 1 in 3·9	43	9	17·3 or 1 in 5·7	325	122	447	27·2 or 1 in 3·6

TABLE V.—*Amputations. For 27 years (1860—1886), to 20 years of age inclusive.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	9	10	52·6 or 1 in 1·9	2	...	...	11	10	21	47·6 or 1 in 2·1
Thigh . . .	17	9	34·6 or 1 in 2·8	3	5	62·5 or 1 in 1·6	116	28	19·4 or 1 in 5·8	14	5	26·3 or 1 in 3·9	150	47	197	23·8 or 1 in 4·1
Leg . . .	27	6	18·1 or 1 in 5·5	7	1	12·5 or 1 in 8	50	4	7·4 or 1 in 13·5	11	2	15·3 or 1 in 6·5	95	13	108	12·03 or 1 in 8·3
Foot . . .	7	...	...	...	...	...	39	1	2·5 or 1 in 40	5	...	...	51	1	52	1·9 or 1 in 52
Shoulder . .	6	2	25 or 1 in 4	...	1	100 or 1 in 1	...	1	100 or 1 in 1	...	1	100 or 1 in 1	6	5	11	45·4 or 1 in 2·2
Arm . . .	25	4	13·7 or 1 in 7·3	4	3	42·8 or 1 in 2·3	7	...	...	4	...	...	40	7	47	14·8 or 1 in 6·7
Forearm . .	19	...	...	4	2	33·3 or 1 in 3	8	...	...	1	1	50 or 1 in 2	32	3	35	8·5 or 1 in 11·6
Total . . .	101	21	17·2 or 1 in 5·8	18	12	40 or 1 in 2·5	229	44	16·1 or 1 in 6·2	37	9	19·5 or 1 in 5·1	385	86	471	18·2 or 1 in 5·4

TABLE VI.—*Amputations. For 12 years (1875—1886), over 40 years of age.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	1	...	..	...	1	100 or 1 in 1	1	1	2	50 or 1 in 2
Thigh . . .	10	7	41·4 or 1 in 2·4	4	5	55·5 or 1 in 1 8	21	16	43·2 or 1 in 2·3	4	...	...	39	28	67	41·7 or 1 in 2·3
Leg . . .	14	14	50 or 1 in 2	11	11	50 or 1 in 2	15	9	37·5 or 1 in 2·6	6	1	14·2 or 1 in 7	46	35	81	43·2 or 1 in 2·3
Foot . . .	3	...	...	8	1	11·1 or 1 in 9	16	5	23·8 or 1 in 4·2	1	1	50 or 1 in 2	28	7	35	20 or 1 in 5
Shoulder . .	2	1	33·3 or 1 in 3	...	2	100 or 1 in 1	1	...	...	...	...	...	3	3	6	50 or 1 in 2
Arm . . .	6	6	50 or 1 in 2	4	4	50 or 1 in 2	3	3	50 or 1 in 2	4	1	20 or 1 in 5	17	14	31	45·1 or 1 in 2·2
Forearm . .	3	...	...	1	...	...	15	...	...	...	...	...	19	...	19	...
Total . . .	38	28	42·4 or 1 in 2·3	28	23	45·09 or 1 in 2·2	72	33	31·4 or 1 in 3·1	15	4	21·05 or 1 in 4·7	153	88	241	36·5 or 1 in 2·7

TABLE VII.—*Amputations. For 12 years (1875—1886), 21—40 years of age inclusive.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	2	4	66·6 or 1 in 1·5	1	3	75 or 1 in 1·3	3	7	10	70 or 1 in 1·4
Thigh . . .	9	2	18·1 or 1 in 5·5	6	4	40 or 1 in 2·5	35	13	27·08 or 1 in 3·6	5	...	...	55	19	74	25·6 or 1 in 3·8
Leg . . .	18	4	18·1 or 1 in 5·5	5	3	37·5 or 1 in 2·6	11	2	15·3 or 1 in 6·5	7	...	...	41	9	50	18 or 1 in 5·5
Foot . . .	5	...	...	2	...	...	28	...	...	5	...	...	40	...	40	...
Shoulder . .	...	2	100 or 1 in 1	...	...	...	...	...	...	1	...	...	1	2	3	66·6 or 1 in 1·5
Arm . . .	9	3	25 or 1 in 4	2	2	50 or 1 in 2	9	1	10 or 1 in 10	1	...	...	21	6	27	22·2 or 1 in 4·5
Forearm . .	11	...	...	2	1	33·3 or 1 in 3	4	...	...	2	...	...	19	1	20	5 or 1 in 20
Total . . .	52	11	17·4 or 1 in 5·7	17	10	37·03 or 1 in 2·7	89	20	18·3 or 1 in 5·4	22	3	12 or 1 in 8·3	180	44	224	19·6 or 1 in 5·09

TABLE VIII.—*Amputations. For* 12 *years* (1875—1886), *to* 20 *years of age inclusive.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	9	10	52·6 or 1 in 1·9	2	...	...	11	10	21	47·6 or 1 in 2·1
Thigh . . .	14	8	36·3 or 1 in 2·7	1	3	75 or 1 in 1·3	69	17	19·7 or 1 in 5·05	9	2	18·1 or 1 in 5·5	93	30	123	24·3 or 1 in 4·1
Leg . . .	18	5	21·7 or 1 in 4·6	5	...	...	34	2	5·5 or 1 in 18	6	...	...	63	7	70	10 or 1 in 10
Foot . . .	3	...	...	...	...	...	37	1	2·6 or 1 in 38	5	...	...	45	1	46	2·17 or 1 in 46
Shoulder . .	4	1	20 or 1 in 5	...	1	100 or 1 in 1	...	1	100 or 1 in 1	...	...	...	4	3	7	42·8 or 1 in 2·3
Arm . . .	17	1	5·5 or 1 in 18	3	1	25 or 1 in 4	7	...	...	2	...	...	29	2	31	6·4 or 1 in 15·5
Forearm . .	12	...	...	2	...	...	5	...	...	...	...	...	19	...	19	...
Total . . .	68	15	17·1 or 1 in 5·5	11	5	31·2 or 1 in 3·2	161	31	16·1 or 1 in 6·1	24	2	7·6 or 1 in 13	264	53	317	16·7 or 1 in 5·9

TABLE IX.—*Amputations. For 12 years (1875—1886), for all ages.*

	Primary.			Secondary.			Pathological.			Expediency.			Total.			
	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Per cent.	Recovered.	Died.	Total.	Per cent.
Hip . . .	...	...	...	...	...	...	12	14	53·8 or 1 in 1·8	3	4	57·1 or 1 in 1·7	15	18	33	54·5 or 1 in 1·8
Thigh . . .	33	17	34 or 1 in 2·9	11	12	52·1 or 1 in 1·9	125	46	26·9 or 1 in 3·7	18	2	10 or 1 in 10	187	77	264	29·1 or 1 in 3·4
Leg . . .	50	23	31·5 or 1 in 3·1	21	14	40 or 1 in 2·5	60	13	17·8 or 1 in 5·6	19	1	5 or 1 in 20	150	51	201	25·3 or 1 in 3·9
Foot . . .	11	...	...	10	1	9·09 or 1 in 11	81	6	6·8 or 1 in 14·5	11	1	8·3 or 1 in 12	113	8	121	6·6 or 1 in 15·1
Shoulder . .	6	4	40 or 1 in 2·5	...	3	100 or 1 in 1	1	1	50 or 1 in 2	1	...	...	8	8	16	50 or 1 in 2
Arm . . .	32	10	23·8 or 1 in 4·2	9	7	43·7 or 1 in 2·2	19	4	17·3 or 1 in 5·7	7	1	12·5 or 1 in 8	67	22	89	24·7 or 1 in 4·04
Forearm . .	26	...	...	5	1	16·6 or 1 in 6	24	...	...	2	...	...	57	1	58	1·7 or 1 in 58
Total . . .	158	54	25·4 or 1 in 3·9	56	38	40·4 or 1 in 2·4	322	84	20·6 or 1 in 4·8	61	9	12·8 or 1 in 7·7	597	185	782	23·6 or 1 in 4·2

TABLE X.—*Principal Amputations performed during the years* 1881—1886.

		1881.		1882.		1883.		1884.		1885.		1886.		Total.	
		Re-covered.	Died.	Re-covered.	Died.	Re-covered.	Died.	Re-covered.	Died.	Re-covered.	Died.	Re-covered.	Died.	Re-covered.	Died.
Primary	Thigh	3	...	2	2	1	...	1	3	1	2	2	1	10	8
	Leg	3	...	7	3	1	1	4	2	6	1	3	1	24	8
	Foot	...	...	2	...	...	...	...	...	2	...	...	...	4	...
	Shoulder	1	...	...	1	1	...	...	...	...	1	1	1	3	3
	Arm	5	...	3	...	...	2	2	...	1	2	1	1	12	5
	Forearm	1	...	2	...	4	...	4	...	1	...	1	...	13	...
Secondary	Thigh	...	1	1	...	1	...	1	...	1	...	3	1	7	2
	Leg	1	...	1	1	1	1	2	...	2	...	1	...	8	2
	Foot	1	...	...	...	1	...	1	...	2	...	1	...	6	...
	Shoulder	...	...	...	...	...	1	...	...	...	1	...	...	...	2
	Arm	1	...	...	1	2	1	...	1	...	...	...	...	3	3
	Forearm	...	...	...	...	1	...	...	...	...	...	...	...	1	...
Pathological	Hip	...	3	...	...	1	...	3	1	1	1	1	3	6	8
	Thigh	10	3	10	1	14	5	5	3	8	4	8	2	55	18
	Leg	...	2	1	1	3	...	2	...	3	1	4	1	13	5
	Foot	7	...	6	...	6	...	10	1	7	...	3	...	39	1
	Shoulder	...	...	1	...	...	...	...	...	...	1	...	...	1	1
	Arm	...	...	1	...	4	...	4	...	...	...	2	...	11	...
	Forearm	2	...	3	...	3	...	2	...	1	...	3	...	14	...
Expediency	Hip	1	...	...	...	...	...	...	1	...	...	...	...	1	1
	Thigh	2	...	3	...	1	...	1	...	4	...	...	...	11	...
	Leg	3	...	1	...	...	...	5	1	1	...	4	...	14	1
	Foot	...	...	...	...	3	...	...	...	...	...	1	...	4	...
	Shoulder	...	...	...	...	...	...	...	...	1	...	..	...	1	...
	Arm	...	...	3	...	...	...	2	...	...	...	...	...	5	...
	Forearm	1	...	...	..	...	...	...	...	...	...	...	...	1	...
Total		42	9	47	10	48	11	49	13	42	14	39	11	267	68

TABLE XI.—*Principal Amputations performed during the years* 1875—1880.

		1875.		1876.		1877.		1878.		1879.		1880.		Total.	
		Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.
Primary	Thigh	9	2	...	3	4	1	4	2	3	1	3	...	23	9
	Leg	2	2	1	2	5	2	6	3	5	2	7	4	26	15
	Foot	1	...	3	...	...	...	1	...	2	...	...	...	7	...
	Shoulder	1	...	...	1	...	...	2	..	...	...	...	...	3	1
	Arm	7	1	2	1	1	...	3	2	2	...	5	1	20	5
	Forearm	1	...	5	...	2	...	2	...	2	...	1	...	13	...
Secondary	Thigh	...	3	...	2	...	3	1	1	...	1	3	...	4	10
	Leg	1	2	2	1	2	2	4	1	3	1	1	5	13	12
	Foot	...	...	...	...	...	1	...	...	2	...	2	...	4	1
	Shoulder	...	...	...	...	...	...	...	...	...	...	...	1	...	1
	Arm	1	...	1	2	1	...	1	...	1	...	1	2	6	4
	Forearm	1	...	1	...	...	...	2	...	...	...	...	1	4	1
Pathological	Hip	4	...	1	4	...	...	...	1	...	1	1	...	6	6
	Thigh	6	5	9	6	8	6	15	4	18	3	14	4	70	28
	Leg	4	1	10	1	7	1	7	3	9	...	10	2	47	8
	Foot	4	...	4	1	5	1	10	2	12	...	7	1	42	5
	Arm	1	...	4	...	1	3	...	...	2	...	...	1	8	4
	Forearm	2	...	5	...	...	...	...	...	2	...	1	...	10	...
Expediency	Hip	...	1	...	...	1	1	...	1	...	...	1	...	2	3
	Thigh	...	1	2	...	2	1	...	...	2	...	1	...	7	2
	Leg	...	...	1	...	...	...	1	...	3	...	...	...	5	...
	Foot	...	...	...	...	...	1	2	...	4	...	1	...	7	1
	Arm	2	...	...	...	...	...	...	...	...	1	...	...	2	1
	Forearm	...	...	1	...	...	...	...	...	...	...	...	...	1	...
Total		47	18	52	24	39	23	61	20	72	10	59	22	330	117

TABLE XII.—*Cases of Secondary Hæmorrhage. For* 10 *years* (1877—1886) *after amputation.*

Amputations.		Recoveries.			Deaths.			Total.		
		No. of amputations.	Cases of sec. hæmorrhage.	Percentage.	No. of amputations.	Cases of sec. hæmorrhage.	Percentage.	No. of amputations.	Cases of sec. hæmorrhage.	Percentage.
Primary	Thigh	24	1	4·1	12	...	...	36	1	2·7
	Leg	47	1	2·1	19	...	...	66	1	1·5
	Foot	7	...	...	...	...	...	7	...	...
	Shoulder	5	...	...	3	...	...	8	...	...
	Arm	23	...	...	8	...	...	31	...	...
	Forearm	20	1	5	...	...	...	20	1	5
Secondary	Thigh	11	...	...	7	...	...	18	...	...
	Leg	18	...	...	11	1	9·09	29	1	3·4
	Foot	10	1	10	1	...	...	11	1	9·09
	Shoulder	...	...	...	3	...	...	3	...	...
	Arm	7	...	...	5	...	...	12	...	...
	Forearm	3	...	...	1	...	...	4	...	...
Pathological	Hip	7	1	14·2	10	...	...	17	1	5·8
	Thigh	110	4	3·6	35	4	11·4	145	8	5·5
	Leg	46	1	2·1	11	...	...	57	1	1·7
	Foot	73	...	...	5	...	...	78	...	...
	Shoulder	1	...	...	1	...	...	2	...	...
	Arm	14	...	...	4	...	...	18	...	...
	Forearm	17	...	...	...	...	...	17	...	...
Expediency	Hip	3	...	...	3	1	33·3	6	1	16·6
	Thigh	16	...	...	1	...	...	17	...	...
	Leg	18	...	...	1	...	...	19	...	...
	Foot	11	...	...	1	...	...	12	...	...
	Shoulder	1	...	...	...	...	...	1	...	...
	Arm	5	...	...	1	...	...	6	...	...
	Forearm	1	...	...	...	...	...	1	...	...
Total		498	10	2·008	143	6	4·1	641	16	2·6

TABLE XIII.—*Sixteen Cases of Secondary Hæmorrhage.*

Amputations.		No.	Age of patient.	Occlusion of vessels.	Day of occurrence.	Death.	Recovery.	Disease.
Primary	Thigh	1	34	Torsion	13th, 14th, 15th, 18th, and 26th	...	Recovered	Compound fracture of tibia and fibula.
	Knee	2	46	„	2 months	...	„	Compound fracture at site of syphilitic necrosis of tibia.
	Forearm	3	15	Catgut ligature and torsion	9th and 10th	...	„	Crushed hand.
Secondary	Knee	4	30	Torsion	33rd	Same day	...	Tetanus (19th day) after compound fracture of tibia and fibula.
	Foot	5	61	Catgut ligature	15th and 22nd	...	„	Secondary hæmorrhage (49th day) from posterior tibial artery (14 days) after compound fracture of os calcis.
Pathological	Hip	6	44	„	26th (slight)	...	„	Old excision of hip.
	Thigh	7	16	Torsion	15th and 21st	21st day	...	Osteo-myelitis of femur with abscess of thigh.
	Thigh	8	20	„	9th	10th day	...	Necrosis of femur and suppurating knee-joint.
	Thigh	9	24	Catgut ligature	14th	...	„	Chronic ulcer of leg.
	Thigh	10	26	„	5th (slight)	...	„	After excision for pulpy disease of knee, with necrosis.
	Thigh	11	25	„	11th (slight)	...	„	Destruction of knee-joint with chronic abscess.
	Thigh	12	20	Silk ligature	34th and 37th	4 months	...	Extensive suppuration of thigh after osteotomy for ankylosed hip.
	Thigh	13	53	Torsion	7th (slight)	Same day	...	Destructive inflammation of knee-joint.
	Thigh	14	36	Chromic catgut ligature	9th (slight)	...	„	Suppuration of thigh following excision for pulpy knee.
	Knee	15	36	Catgut ligature	8th (slight)	...	„	Ununited fracture in infantile paralysis.
Expediency	Hip	16	21	Torsion	16th and 18th	18th day	...	Sarcoma of femur.

DESCRIPTION OF PLATE

Illustrating Mr. John Poland's Case of Secondary Hæmorrhage.

The illustration shows the posterior aspect of the popliteal artery and vein ending below, at the upper end of a small sloughy abscess-cavity, from which suppuration had extended upwards between the coats of the artery. The artery is laid open for an inch and a quarter above the separated coats, and a rod is passed down the lumen of the vessel within the separated internal coat and into the abscess-cavity below.

A. Small sloughing abscess-cavity.

B. Outer coats of artery thickened and imperceptibly blended below with the walls of the abscess-cavity.

C. Upper limit of suppuration between the tissues of the vessel.

D. Inner coat lying loose like a tube or cast within the outer coats of the artery.

E. Popliteal vein filled with clot.

F Ruth. Lith.ª Edin.ª

OBSTETRICAL SOCIETY OF LONDON

ON

MASSAGE AND THE WEIR MITCHELL TREATMENT.

By W. HALE WHITE, M.D.

As the subject of massage is at present exciting much interest, and as inquiries about the method of it and the cases suitable for it are constantly being made, I thought those recorded at the end of this paper might prove interesting to some of the readers of these 'Reports,' for they illustrate the treatment of both suitable and unsuitable cases.

There is nothing new about massage; it is of great antiquity. The oldest records of the Chinese and Hindoos contain accounts of this or allied methods of treatment; of late years it has been pushed forward by a number of ignorant charlatans. The very fact that their name was associated with it would have caused it to be neglected by the profession at large, were it not that fortunately a few of the leaders of medicine in this country, America, and Germany, stepped forward, and by putting it upon a scientific basis secured for it a tardy but genuine recognition.

The word massage is used to denote the method of causing the absorption of inflammatory and effete products, and the acceleration of blood and lymph currents by mechanical manipulation. He performs it best who remembers its object and his anatomy. Although no doubt it is a great advantage

to see it performed, anyone who is not too clumsy can, if he bear in mind the position of the chief vessels and muscles of the body, perform it efficiently from written descriptions. It is not half as difficult as most surgical operations, and yet such is the air of mystery which has been thrown around it that many seem to imagine it can only be performed by those who are specially gifted. In support of what I say, I may mention a patient who told me that he was undergoing massage, and that the performer claimed by it to be able "to impart some of his vital spirit" to the patient. If those who wish to learn it cannot get an opportunity of seeing it done, the following description may be useful, provided that the operator does not follow it too slavishly, but bears in mind its object, and that there are other methods equally good; for, as Playfair says, the way to judge massage is not by how it is done, but by the results it produces.

The patient should lie on a rather hard bed with a large blanket immediately under him. Only the part which is to be massaged should be uncovered at a time. Let us suppose that the lower extremity is to be operated upon. If the hair is long it should be cut, and if the operator prefer it the part should be greased, but I have given up doing so, as I found one got a better grip without it. Then, beginning at the toes, the foot should be firmly stroked several times with the ulnar edge of the hand, on both the dorsum and the sole; the same should be done to the leg from the ankle to the knee, and to the thigh from the knee to the hip. For these larger parts some find the whole hand better than the ulnar edge. As the object of this is to aid the cutaneous venous flow the stroking must always be from below upwards, and if, as in the back, it be difficult to stroke in the direction of the veins, the direction must always be uniform. Next, again beginning at the toes and working upwards, a fold of skin should be pinched up between the thumb and forefinger, and lightly twisted so as to give no pain; the whole skin should be treated in this way. The beneficial effect in aiding the cutaneous circulation is at once seen in the redness of the skin that this treatment of it produces. Both hands may be employed, one following the other. After this the muscles should be grasped between the thumb and fingers of each of the two hands, and

thoroughly kneaded from below upwards, the object being to accelerate the flow of lymph and blood in them. Then passive movements should be made of all the joints, such as the toes, ankles, knees, and hips, with partly the same object as the muscular kneading, and partly with that of aiding the absorption of any fluid that may be in them. Many operators in addition employ one or more of the following manipulations: pressing the muscles slowly upwards with the tips of the fingers, tapping or thrusting at the part with the extended finger-tips, or hitting several successive blows with the ulnar border of the hand, a method which Schreiber[1] and others call "hacking." Any or all of these manipulations may be used; they are chiefly indicated in painful affections such as neuralgias and rheumatism. Massage is best performed upon the naked body, but, if this be objected to, thin, closely-fitting clothes may be worn. If the massage of the whole body is to take half an hour a good subdivision of the time is, lower and upper extremities five minutes each, or twenty minutes, and five minutes each for the abdomen and back. Directly the massage of any part is ended it should be covered up with the blanket, and when the whole body is finished the patient should lie at rest for some time wrapped in the blanket, for she must be kept warm. The face and head rarely require massage.

Both male and female nurses can be taught to do it efficiently, but it is necessary that the doctor who has charge of the case should see them do it, as often they have preconceived notions of their own which require to be eradicated.

The evidence that massage can aid absorption and circulation is not only clinical but also experimental. That the circulation in massaged parts must be accelerated is too obvious to need any demonstration, for it is well known that, because of the valves in the veins, stroking in their direction will aid the flow of blood in them, and also mechanical stimulation of the skin will dilate the arteries in it, and likewise kneading the deeper structures will force the blood along the veins and dilate the arteries, and lastly, the active and passive movements of the limbs, by the muscular contraction thus caused, will greatly accelerate the deep venous flow.

[1] 'Manual of Treatment by Massage,' translated into English by W. Mendelson.

Many experiments have been performed with the object of demonstrating the effects of manipulation upon a part. Von Mosengeil[1] injected coloured fluids such as carmine or indian ink into the elbows and knees of rabbits; on one side the joints were manipulated and the fluid was seen to rapidly disappear from them; the animal was killed soon after, and the corresponding lymph-glands and lymph-channels were found filled with coloured particles on the side of the body on which the manipulation had been performed; on the other side, which had not been manipulated although the fluid had been injected into the joints, the lymph-glands and channels contained no coloured particles.

Reibmayr[2] also showed that the absorption of water injected into the abdominal cavity could be accelerated considerably by massage of the abdominal wall. Zabludowsky[3] made a series of experiments upon fatigued muscles, and found that their capability to respond to electrical stimuli is more quickly recovered if the muscles be massaged than after simple rest. From these, and somewhat similar experiments by Kronecker and Stirling, there seems no doubt but that massage may be looked upon as a means both of rapidly removing waste products from a muscle and bringing new nourishment to it. Reibmayr points out that there is not only this direct effect upon the muscle, but that the accelerated pulse and respiration which follow on massage, show that there are reflex effects which must aid the direct ones.

Godpadze[4] states, as the result of experiments upon healthy young men, the following facts. Massage increases the appetite, nitrogenous transformation and assimilation are augmented independently of variations which might be due to alterations in diet, there is a gain in weight, and respirations become deeper and more frequent, but the pulse is sometimes slowed and sometimes accelerated. Other observers have obtained the same results, and it has been shown that abdominal massage increases the peristaltic movements of the

[1] 'Verh. der deutsch. Gesellsch. f. Chirurgie,' 4th Congress, 1875, p. 154.

[2] 'Die Massage und ihre Verwerthung in der verschiedenen Disciplinen der praktischen Medicin,' 2nd edit.

[3] Centralblatt f. die medicin. Wissenschaften,' 1883, No. 14.

[4] 'Lancet,' vol. i, 1886, p. 982.

intestines, and probably also the functional activity of the liver. Dr. Eccles[1] has recorded a series of observations he made on the effects of massage upon healthy individuals. His results are confirmatory of those just mentioned. As showing its beneficial effect upon fatigued muscles he mentions one experiment in which a man was made to rhythmically grasp a dynamometer till the hand was so tired that the instrument only registered 5 lbs.; after ten minutes' rest the patient was able to register about 10 lbs., but even if the muscles were more tired than in this experiment and massage was then performed upon them for ten minutes they could register 45 lbs. As proof of the increased absorption from muscles by massage, Graham Brown and Eccles have both been able to reduce the circumference of a limb as much as three eighths of an inch by this means. The last-named observer also shows that while massage of the limbs increases the pulse-rate considerably, abdominal massage, as might have been expected, decreases it, therefore it is better in general massage to operate upon the abdomen first in order that the depressing effect of this may be overcome by the operation upon the extremities. From one hundred observations he shows that generally massage temporarily increases the bodily temperature except in the case of abdominal massage.

The cases appended to this paper consist of three in which the Weir Mitchell treatment was used for hysteria, two in which massage was used for constipation, and one ill-defined case.

The Weir Mitchell treatment for hysteria and allied nervous conditions consists of—(1) Isolation, the object of which is to take the patient away from all sympathy, and remove her entirely from the world in which the hysteria has been developed. (2) Rest in bed, the object of which is to secure absolute rest for many organs, such as the stomach, muscles, &c., whose functions are perverted in these cases. (3) Overfeeding in order to make up for the wasting that these patients generally show, and for the increased tissue change caused by the massage. (4) Massage. From what has been said about the physiological effects of massage it is clear that its object is to increase the circulation in and thus to accelerate the removal

[1] 'Practitioner,' vol. xxxviii, p. 401.

of waste products from, and the access of blood to, the wasted and almost useless muscles. By this means their bulk and functional activity are increased. (5) Faradization. The object of this is to help the changes in the muscles by causing frequent contractions of them.

The appended cases illustrate the following useful points about this treatment for hysteria.

Isolation.—This is by far the most important part of the treatment.

It must be absolute. The only people who see the patient should be the doctor and nurses. No letters must be received. It will be observed that the treatment of Cases 1 and 2 was first of all attempted without isolation; in each case it was a lamentable failure. Dr. Playfair[1] says, "I do not think that any compromise on this point should be admitted . . . . it should be made an absolute *sine quâ non* that she (the patient) should be placed in a separate room with her nurse, and that she should not be visited by anyone except her medical attendant." Dr. Weir Mitchell[2] is equally strong on this point. Dr. Lauder Brunton's[3] case shows that the same is true of men. It is, however, a mistake to suppose that whenever massage is indicated, isolation must be enforced; this is only necessary when the case is chiefly or entirely neurotic.

Insanity.—The more nearly the case is allied to one of insanity the less likely will it be to do well. This is strikingly shown in Case 2. As the fact of the insanity was concealed, it was very difficult to understand why she did not get on faster, although the diarrhœa stopped. The reason of her backwardness was explained by the appearance of symptoms of insanity, and by the correct history afterwards obtained. It will, however, be observed, that in spite of the insanity she improved much more when isolation was made complete and compulsory. The family history was probably partly accountable for the failure in Case 3, more especially as some of the hysterical attacks which have since been deve-

[1] 'The Systematic Treatment of Nerve Prostration and Hysteria,' p. 16.

[2] 'Fat and Blood; an Essay on the Treatment of certain forms of Neurasthenia and Hysteria.'

[3] 'Disorders of Digestion,' p. 79.

loped were very like mania, and Case 6 was so near the borderland that very little permanent good was to be expected.

Fatness.—The easiest cases of hysteria to cure are those in which the wasting is most extreme; those that are plump are the most difficult. Before I knew that Case 3 had had rheumatic fever, and before I had her complete family history, the fact that she was fat made me give a very guarded opinion about the advisability of the Weir Mitchell treatment. How far in this particular case the failure was due to the patient being plump is perhaps doubtful, but still the general rule holds good, and instances of it will be found in Dr. Playfair's book.

Faradization.—This is only an adjunct to the massage, and an unimportant one. Case 1 shows that severe cases can quickly get well without it.

Feeding.—There is an erroneous impression that the food must always be of a particular sort. The variations in diet in the cases here recorded show that this is not so. The diet must be at first as simple as possible, and therefore it is well to begin with milk, and afterwards plain articles can be added. The meals must always be very frequent, at first they should be small, but afterwards very large; if the patient be doing well it is impossible for her to eat too much. Sir William Gull's case[1] shows the great importance of overfeeding.

The nurse.—It will be noticed that Case No. 1 at one period took a great dislike to her nurse. It is of the greatest importance in carrying out the Weir Mitchell treatment that the patient should like the nurse, who must not be a half-educated, rough one, but refined, pleasant in her manner, and above everything combining firmness with kindness.

The above remarks all refer to the Weir Mitchell treatment, and it will be noticed that even in those cases in which it fails, the massage and over-feeding will often lead to a great improvement in nutrition.

Constipation.—The *rationale* of massage in this condition is that by it both the muscles of the abdominal wall and the unstriped muscle of the colon will be stimulated to increased activity and growth. Cases 4 and 5 show its great value in this condition. Isolation, rest, and overfeeding are of course unnecessary. The massage should be applied in the morning

[1] 'Lancet,' vol. i, 1888.

before the patient gets up, so that the bowels may be moved at the natural time. The object the operator should have in view is that of acting upon the muscles of the abdominal wall, and also upon the colon. To secure these ends the massage should be up the right side of the abdomen, across at a little above the umbilicus, and down the left side, so that it may follow the direction of the colon. Each operation should commence by the massage being performed comparatively superficially so as to influence the muscles of the abdominal wall; afterwards the manipulation should be as deep as possible, so as to affect the colon directly; this can be done by pressing deeply and moving the hands with a kind of rotatory motion, and then pushing them, pressed deeply into the abdomen, in the direction of the colon. The duration of the operation should be ten or fifteen minutes daily. Often the cases are quickly cured, but in very obstinate ones it may be necessary to continue the treatment for six weeks. In Case 4 the massage was applied to the whole body as well as the abdomen, because from long-standing indigestion and want of exercise the patient's muscles were very flabby.

Case 6 is only introduced to show how in a case so unsuitable as to render a cure hopeless, massage and feeding will improve the general condition.

Massage has been tried in a great variety of conditions. The Weir Mitchell treatment has proved of the greatest value in cases of opium[1] and chloral habit. Massage alone has effected many cures in cases of sciatica and chronic rheumatism. The results in other diseases are not sufficiently striking for them to be mentioned here, but details of them will be found on reference to the authors mentioned in the text.

Case 1. Miss Mary B—, æt. 33, had a bad attack of hysterical vomiting four years ago, since when till the present attack she has been in excellent health. I saw her in the spring of 1887. Seven months previously she had had, after much anxiety, a severe shock, after which the vomiting returned. She was sick after everything she took, and even plain water was rejected. She was sent into a pay bed in a general hospital. Here she had many medicines; massage and diet

[1] Sharkey, 'St. Thomas's Hosp. Rep.,' vol. xvi, p. 231.

were tried, but after six months' stay, as she was no better, she was taken out. She had a great dislike for the nurse who performed the massage. I saw her at her home with Dr Cox; she was reduced to a mere skeleton, vomiting everything she took, even if it were only a little water. There was some pain and tenderness over the stomach, and a faint systolic murmur over the cardiac area.

I refused to have anything to do with the case unless I was allowed to isolate her completely for as long as I liked. The friends agreed; lodgings were taken for the patient, and a suitable nurse was found.

Miss B— arrived at her lodgings on the evening of April 9th. She was so weak and thin that the expression of those who carried her upstairs was that she would never go away except in a coffin. During the first six days she had milk in small quantities at frequent intervals, beginning with half a pint, and reaching three pints daily on the sixth day. Then she was allowed a little jelly, and some of the milk was just coloured with tea.

April 19th.—She was allowed a little toast.

20th.—The extreme sickness had been getting less and less until this day she was not sick at all. During the remainder of her stay there were only five days on which she was sick, and even then she never vomited severely. The last time was on May 4th, and then the sickness was but slight, and might fairly be attributed to some of her food being underdone.

It would take too long to enumerate her diet for each day; the principle of her feeding was to give her abundance of easily digestible food at frequent intervals. She had much fruit such as rhubarb, oranges, and lemons, partly as natural aperients, and partly because she was very fond of them. As examples we may take the following days:

23rd.—7 a.m., oatmeal and plenty of bread and butter. 11 a.m., jelly and bread and butter. 1 p.m., as at 7 a.m. 4, 7, and 11 p.m., as at 11 a.m. She also had during the twenty-four hours two and a half pints of milk, two oranges, two lemons, and some honey.

30th.—6 a.m., tea and bread and butter. 8 a.m., oatmeal and bread and butter. 11 a.m., jelly, stewed apples, and bread and butter. 1 p.m., custard, stewed rhubarb, and

bread and butter. 4 p.m., boiled egg, stewed rhubarb, and bread and butter. 7 p.m., as at 8 a.m. 11 p.m., bread and butter. During the twenty-four hours she had in addition two pints of milk, a lemon, and some honey.

May 6th.—She had eight distinct meals, including chicken, vegetables, jam, sponge cakes, and at intervals during the day she consumed two pints of milk.

I need only say that before she went out she was able to eat plentifully of bacon, veal patties, fish, bananas, lamb, and in fact anything that the other members of the household ate, although for the previous eight months she had been sick after everything she had taken.

Massage was begun on April 11th, and left off on May 18th. At first only the limbs were massaged for half an hour a day, but the process was gradually extended, and by the end of a week the whole body was thoroughly massaged for an hour in the morning and an hour in the evening. This part of the treatment was gradually left off, the full time of two hours a day lasting for four weeks. She always felt better and slept well after it. The muscles, which on admission were very flabby, became much firmer, and quickly increased in size, so that when she left they were of normal size. She was rubbed especially over the stomach, where she felt pain, which soon disappeared. She was kept absolutely at rest in bed till May 8th, when she sat up for it to be made. She was soon able to sit up for longer each day, and before she left she was able to walk a mile in the street, to go up and downstairs, and to take a cold bath in the morning, and a warm one at night. For the first four weeks she was not allowed to receive nor to write any letters, and no friend saw her till the end of the fifth week. As she lay in bed she was allowed to do a little easy needlework, and occasionally to read a light novel. Two days before she went away she weighed 9 st. 6 lbs. No drugs whatever were used. She drove away to the railway station in a hansom exactly six weeks after the treatment was begun. I have heard of her since, and she remains quite well and able to walk many miles.

A similar case has recently been published by Dr. Dutton.[1]

[1] 'Lancet,' vol. i, 1888, p. 1128.

Case 2.—Miss G—, æt. 26. The history which I got from her and her friends was that her father was a very nervous but a very able man. When fifteen years old she was under treatment for a hysterical cough, which vanished on the appearance of an attack of diarrhœa that kept her in bed ten days. She went to India in 1880; soon after her arrival she had an attack of dysentery and congestion of the liver. Since then she has always been liable to the former. She has passed blood. She was at her worst during her last year in India. She came home in April, 1885. Since then, till I saw her in September, 1887, she has had continued diarrhœa, gradually getting less and less like dysentery.

No drugs or dieting have had any effect upon the diarrhœa; she went about from place to place in England and tried various doctors without any benefit. The bowels were on the average opened eight times a day, but frequently they were open as often as sixteen times; there has been much internal pain. The left leg began to drag about two years ago, and she had pain in it on standing.

On September 16th, 1886, she took to her bed, where she has remained ever since. In February, 1887, she travelled many miles by rail, and had to go the whole distance in an invalid carriage in which she could lie down, and in June she came to London in the same way. She went into a special hospital, where, although her bed was curtained off by curtains six feet high from the rest, she was not isolated, as her friends and the other patients could come and see her, and she could hear all that went on in the ward. Six weeks after she was there massage was begun; but after three months' stay she left totally unrelieved. Dr. Howard Champ, who had often seen the patient, kindly wrote to me to say that the above account was as far as he knew correct.

I first saw her on September 22nd, 1887, in some lodgings in London that her friends had taken for her. She was very pale, lying on her back in bed, and although 5 feet 6½ inches high, she only weighed 4 st. 9 lbs. 12 oz. There was frequent diarrhœa, the motions were pale, fluid, contained no blood or mucus, and had nothing dysenteric about them. No physical signs could be detected. I recommended the same treatment as in the last case, and the patient was isolated on

September 29th, 1887. She was made to keep in bed and took four and a half pints of milk a day. The diarrhœa diminished and the motions became more natural till October 9th, by which time her diet by gradual increments had advanced to five pints of milk, one pint of strong soup, five to ten slices of toast and butter with some biscuits daily. The bowels were only open twice a day, the motions were formed and natural.

October 9th.—Massage of the feet and legs was performed for a quarter of an hour. The patient had foretold that this would lead to diarrhœa, and so it did; the bowels were open five times that day, and the motions were very fluid.

The next day she was massaged again for half an hour, and had at 9.30 one and a quarter pints of milk, fish and four pieces of toast; 11.30, beef sandwiches; 1.30, minced mutton, vegetables and bread; 4, yolk of an egg, milk, and biscuits; 7.45, as at 1.30; 9, a small cup of milk and some biscuits. The bowels were open five times, and the motions were very fluid.

The next day, 11th, the same treatment was continued, the massage was increased to forty-five minutes, and the bowels were open three times.

12th.—Same treatment; bowels open four times, but the motions were well formed.

13th.—The diarrhœa stopped. At 7.30, she had a cup of milk with an egg beaten up in it; 9.30, fried ham, bread and milk; 11, boiled rice and marmalade; 1, cold mutton and jelly. During the afternoon three eggs beaten up in milk; 7.30, Yorkshire pudding and some gravy, and at 10 p.m., a banana and milk. From this time onwards the massage was performed daily, and was gradually increased to one hour both morning and evening; the overfeeding was continued; thus as an example I may give the diet for October 26th: 7.30 a.m., milk, sugar, and biscuits; 9, two sausages, coffee, and bread and butter; 11, cold beef, toast and butter, and milk; 1.30, mutton, vegetables, bread, and milk; 4.30, as at 7.30 a.m.; 7.30 p.m., roast mutton, vegetables, bread and milk; 10, as at 7.30 a.m. During the night some milk and biscuits.

31st.—Bowels acted twice, and the motions were formed; from this time onwards the motions were always well formed,

and the bowels were only open twice or three times a day. By the end of November they were moved twice a day regularly, remained so for a fortnight, and then for some time they were opened once a day.

November 1st.—In order to exercise the muscles of the upper extremities, she was made to grind her own coffee, and in order to exercise those of the lower, dumb bells were hung over the end of the bed and strapped to her feet, and she was made to pull them up and down regularly. These exercises were continued till she was sufficiently able to walk about for them to be unnecessary. Towards the end of October she read the newspaper a little; gradually her recreation was increased till she did both needlework and reading.

12th.—She sat up in a chair for twenty minutes; she continued her abundant diet.

18th.—She got in and out of bed herself, and the next day she had a bath, and two days after this she walked a few yards with a little help. From this time onwards the power of walking increased, and by December 5th she was able to walk up a short flight of stairs to a bath room, where she had to get in and out of the bath herself, and she did it successfully. She continued to eat abundantly, although not so fully as the first case, for I found that if the food was pressed too much she refused it altogether.

On December 7th she saw her sister. The day after the patient was much worse, and made out that she could neither walk nor eat; this attack passed off in four or five days. She did very well indeed up to the 25th, the bowels being open regularly twice a day; the motions were normal; she took her food well, got up at eight in the morning, could easily walk up three flights of stairs, and took her bath by herself. The massage and other parts of the treatment were continued, and the muscles increased in bulk and firmness.

On the 25th she refused her food, and would not walk saying she was too stiff to move. She began talking great nonsense, saying she was Beelzebub.

26th.—She was rational this morning, but her condition yesterday made me sure that there was some insanity connected with the case. The patient herself seemed to appreciate that yesterday she was out of her mind, for when I went to see her

she asked if the nurse might leave the room, and when she was alone with me she confessed that the fact that, when about fourteen years of age, she had been shut up in Bethlem, had been concealed from me. In the afternoon she again refused her food, and talked nonsense.

27th.—She still continued to talk in the most mad way, saying that she was all sorts of people, that evil spirits haunted her, that she knew she was going to have a baby, and that her mother wanted her to marry twenty-seven officers. She looked much worse, and did not take her food well. Dr. Savage saw her this afternoon. He gave a doubtful prognosis, but said he thought that the treatment of abundant food and massage offered the best chance of recovery. The remainder of the case can be quickly summed up. The symptoms of insanity and repugnance of food increased. It was found necessary to feed her artificially. The loss of flesh and increasing weakness were very noticeable.

On January 2nd she fell back dead, the pulse stopping before the respiration, which continued for fifteen minutes after any cardiac sounds could be heard. This suddenness of death is well known in cases of insanity.

Case 3.—Miss B—, æt. 34. Dr. Bateman, who has attended the family, tells me that both parents are highly neurotic; the mother has been bedridden for thirty years with spinal pain, the father is a highly intellectual man who suffers from many nervous symptoms, and to whom every trifling ailment is a tragedy.

The patient is plump, well formed, and cheerful when spoken to, but complains of great weakness and depression of spirits. She had rheumatic fever when she was about fourteen. Five years ago she was in much the same condition as she is now; a prolonged holiday did her much good. A year ago she had typhlitis; from this she recovered and went to Brighton for two months, but when she returned to London she was very weak, and consequently went to Devonshire, but was there so weak that she had to take to her bed; this condition of weakness has, she says, continued till now. The least exertion is said to utterly prostrate her, and she has indigestion, backache, and insomnia, but takes her food well. She came

to me wishing to be massaged. At first I would not undertake the case, because it seemed an unsuitable one for the following reasons: There was a strong hereditary history, the muscles were plump and well formed, many of the symptoms were voluntarily exaggerated, and lastly, she and her friends did not take at all kindly to the idea of isolation. Eventually, however, after some weeks' waiting to see if she would improve by other means, a trial was made. It should be mentioned that there were no signs of organic disease to be detected save that there was occasionally a faint apical systolic murmur.

The onset of menstruation delayed the commencement of the massage for some time after she arrived at the home where she was to be isolated. The flow was very profuse, the pain was very great, and the patient much exhausted.

At first she liked the massage, but after a few times she complained of being utterly prostrated by it, and feeling very faint after it. It certainly caused the apical systolic murmur to become much more marked, the pulse became irregular and dicrotous, and she had much headache. She professed herself nevertheless very anxious to go on with it, but however little was done it now always produced the above symptoms. The treatment was therefore discontinued, but the patient did not seem very disappointed. She went to Bournemouth, and Dr. Bernard Scott, who attended her there, wrote to me to say she had several distinctly hysterical attacks accompanied by mania, and at one time he was much afraid that she would become a fit case for an asylum.

Case 4.—Mr. L. A. F—, æt. 43, whom I saw in consultation with Mr. Golding-Bird, gave the following history. He is engaged in the City in work which involves much hard work and responsibility. He is in the office from nine to six, or even longer, and for eight years he has had no other holiday than an occasional afternoon. He has no time to go out and get his lunch; it is brought to him.

Ever since he was at school, thirty years ago, he has suffered from constipation; for the last fifteen years he has been obliged to use enemata, now they are becoming less and less efficacious; no purgative given by the mouth has been of any

use for ten years or more. His plan is to give himself an enema directly he gets out of bed. He then goes to the bathroom, and usually, if the enema is going to act, it does so either while he is in the bath-room or shortly after: he has had his house built with a water-closet attached to the bath-room. For many years past he has suffered on and off from piles, and continually from indigestion, the chief symptoms of the latter being great weakness and depression, a nasty taste in the mouth, eructations, numbness of the hands, flushing of the face, pain over the sternum, and frontal headache. He only drinks a moderate quantity of alcohol. He came to Mr. Golding-Bird with a complaint of a discharge from the urethra and disagreeable sensations on micturition. Examination of the urethra did not reveal any disease. He has not slept away from home for a single night for nine years, and it is eight years since anyone came to see him at his house, and six since he went out in the evening. Formerly he used to be fond of theatres, dinners, and society. He is unmarried, and lives alone.

There were no physical signs, the rectum was capacious, but normal save for the piles.

The treatment adopted was that of giving him simple diet, massaging the body thoroughly—the abdominal wall being operated upon more than any other part; the faradic current, as strong as the patient could bear it, was applied to the abdominal muscles, and also for a short time he took some nux vomica and iron pills, but they were soon discontinued. For the first day, February 17th, the treatment was: 7.15 a.m., a glass of milk, after which the whole body was massaged for forty minutes; the abdomen received much more than its share, and here the treatment consisted in massaging in the direction of the ascending, transverse, and descending colon, after which the faradic current, as strong as the patient could bear it, was applied to the abdominal muscles for five minutes; 9 a.m., some porridge, a pint of warm milk, and some toast; 1 p.m., rusks and milk; 6 p.m., some beef-tea and toast; 6.30 p.m., forty minutes' massage and faradism as in the morning; 7.45 p.m., some milk pudding, a glass of milk and toast.

He rose at 8.30 a.m., went to bed at 11, started for the

office at 9.45, returned at 6 p.m. These hours he continued during the whole of the treatment.

February 21st.—The treatment has gone on precisely the same since the last note. The patient has used an enema every morning, but this morning the bowels were open without any aperient or enema for the first time for fifteen years. The indigestion is much better.

23rd.—The meal at 7.45 p.m. was increased to some plain fish, as whiting, greens, milk pudding, and a little whisky and water. He had fruit for breakfast.

25th.—The constipation has been very troublesome since February 21st; enemas had no effect, but this morning the bowels were open naturally. He had an omelette for breakfast.

March 3rd.—Now he always has a glass of milk at 7.15 a.m., breakfast of fish or omelette, tea and toast; lunch of oysters, rusks, or plain biscuits and a little claret; a cup of beef-tea and toast at six; fish or mutton, greens, milk pudding or custard, with a little whisky and water, for dinner at 7.45. The massage and faradism are applied morning and evening for forty minutes. Since the last note he has been compelled to use enemata, but to-day the bowels were open naturally. He feels very much better in every way.

11th.—For the past week the enema has consisted of only a little plain water; about 5 oz. or 6 oz. was used to begin with, and gradually this quantity has been diminished day by day. The bowels are now open either without any water or immediately after the injection of it. Before the treatment was begun the patient always used from three quarters to one pint of soap-and-water, which took at least a quarter of an hour to act, and often had no action at all. The diet remains practically the same; slight variations are made to prevent its being monotonous.

25th.—For the past week the bowels have been open naturally every morning without any injection, save once, when 2 oz. of plain water were used. He has gained 1½ lbs. in weight. He is not so fat but more muscular, and the muscles are firmer. The massage, faradism, and diet have all been continued as before.

April 1st.—Since the last note he has been troubled much

with piles, which render defæcation painful: it was suggested that he should take some senna; he said it would be useless, for he had taken it often before without any effect. One and a half drachms of the confection were given at night, and to the patient's great surprise the bowels freely opened the next morning. The same applies to glycerine; before the treatment was begun a glycerine injection had no effect in opening the bowels, now as, owing to the piles, defæcation is painful, 1 oz. is occasionally injected into the rectum, with the effect that the bowels are easily moved directly after.

3rd.—The piles do not trouble him now. During the last fourteen days the massage has been gradually diminished, but the bowels are open regularly every morning without any aperient or enema.

5th.—For the last two days there has been no massage or faradization, but the bowels have been open regularly each morning without any enema or medicine. To-day the patient ceased seeing me. He is very much better in every way. He looks healthier, he weighs 1½ lbs. more than he did, he is more muscular and less fat, he is much brighter and more cheerful, and he has lost all his many symptoms of indigestion. He is not so melancholy, and takes much more interest in people; the other night he went to the theatre, and he has promised to take a long holiday. There has been no complaint for some weeks of the urethral trouble.

30th.—He wrote to say he was still much better, and had only once used an enema during the last three weeks.

August 22nd.—He wrote to say that he had just come back from a trip to America, that his health was good, but that he occasionally had symptoms of indigestion. He had had no constipation since he last wrote. It will be observed that in this case not only was the constipation cured, but the digestion was improved, the urethral trouble entirely disappeared, and the retired, solitary habits of the patient were broken up.

Case 5.—Mrs. F—, æt. 30, has suffered from constipation since she was ten years old. At the age of twenty-three, as all ordinary purgatives taken by the mouth had ceased to have any effect, she began to use enemata. After some time they began to lose their efficacy; lately she has been injecting

glycerine into the rectum. She has much dyspepsia. I directed that abdominal massage over and in the direction of the colon should be applied on waking in the morning, for fifteen minutes. A simple regular diet was prescribed. She left for Australia in less than a month from the time she was first seen, but I heard that since using massage it had only been once necessary to use a rectal injection.

Case 6.—Mr. H—, æt. 45, a bachelor; he is of a very religious frame of mind, and belongs to the extreme Ritualistic party, his family are very neurotic. He himself is very eccentric, reads a great deal, lives very much alone, speaks but little when in the presence of anyone, answers questions by monosyllables, and is often very depressed in spirits. He has been abroad, and says that then his liver became enlarged. He can never be persuaded to take any active exercise. He came to me complaining of indigestion, saying that any food taken after 2 p.m. upset him, and for months he would touch nothing after that hour. He complains very much of what he calls weakness of the intestines, and says he is constipated, but it is not clear from cross-examination that this is so. His weight in his clothes is 9 st. 5 lbs., he is tall, and looks very thin.

He and some of his friends are extremely desirous that massage should be tried, therefore after consultation with a friend of his, who is a well-known surgeon, it was determined that he should be massaged thoroughly, not because we hoped that much permanent good could be done, but because it was clear that if we advised against it he would fall into the hands of some quack. He had great faith in electric belts.

The treatment adopted was that he left his home for six weeks and came to live in London. Every day he went for a walk and was encouraged to go to see his friends, and to go sight-seeing in order to take him out of himself. At 7 a.m. he had a cup of coffee and a piece of bread and butter; at 8.30 an omelette or fish, with toast and coffee; at 11 beef-tea and toast; 1 p.m., fish or mutton, green vegetables, milk or bread-and-butter pudding, and a little whisky and water. 4.30, a glass of milk and a biscuit; at 7 a meal much the same as at 1, and at 9.30 p.m. often a cup of cocoa and some

biscuits. This diet was not reached at once, but little by little his meals were increased and this scale was attained after he had been under treatment a week; it was continued till he passed out of observation. He was massaged all over for half an hour morning and evening.

At the end of a fortnight he had gained a stone in weight, his muscles were firmer, he slept well, was more cheerful, and made no complaint of any of the symptoms which he said troubled him before the treatment. There was no indigestion, he was more cheerful, and better in every way. He often went to see his friends, and had taken to riding. The massage was continued for another fortnight, it was then gradually diminished day by day, and at the end of five weeks he returned to his duty in the country. I have heard since that, as was expected, he soon relapsed into his old ways. Some months later he joined a Ritualistic brotherhood, and wrote to me to say that since doing this he was astonished to find that he could eat plenty, and even take a supper of bread and cheese and beer.

This case, like No. 2, shows that although massage and feeding may greatly improve the patient, a cure cannot be expected when the patient is on the borderland of insanity.

ON MULTIPLE NEURITIS.

By FREDERICK TAYLOR, M.D.

One of the most important additions to the subject of nervous diseases is the recognition of the fact that an inflammation of several peripheral nerves, multiple neuritis, may be the cause of very definite paralytic symptoms, and some cases of this kind may prove of interest to the readers of these 'Reports.'

Dr. Buzzard very clearly summarised in his Harveian Lectures for 1885 the knowledge that had been gradually accumulating on this subject, adding much from his own experience; and he showed us how neuritis might be a cause of paralytic symptoms in gout, diphtheria, lead-poisoning, chronic alcoholism, and other less definite conditions. Since that time it has not been difficult to recognise numbers of instances of neuritis that would previously have gone under some other name, or remained a puzzle to observers.

Of the several causes of peripheral neuritis, chronic alcoholic poisoning seems to be by far the most frequent, and at least six of the cases which I publish here were due to this cause. Diphtheria and lead-poisoning are also causes which are in frequent operation, that is to say, that in diphtheritic paralysis, and in lead paralysis, which have been so long familiar to us clinically, while inexplicable and obscure pathologically, it has now been shown sufficiently often that the nerves, and not the spinal cord or the muscles, are the parts involved in disease.

Neuritis has also been seen in gout, in poisoning by arsenic, and it has been found to account for various painful symptoms in the course of tubercular phthisis, and to occur in the neighbourhood of joints affected with osteo-arthritis. In other cases possibly cold is the cause of a general neuritis of several of the peripheral nerves; and in others, again, it may be difficult to explain the origin of the symptoms.

From the observations of Starr[1] and others it appears that neuritis has been observed under many other circumstances. The following is a full list: 1. As a result of poisoning by alcohol, lead, arsenic, copper, bisulphide of carbon, carbonic oxide, ergot. 2. In connection with numerous diseases, namely, simple pharyngitis, diphtheria, scarlet fever, rötheln, measles, typhus, enteric fever, tuberculosis, epidemic cerebro-spinal meningitis, leprosy, mumps, cholera, syphilis, puerperal conditions, rheumatism, gout, diabetes. 3. From exposure to cold, wet, damp, or fatigue, and from mental excitement. 4. The disease known as beri-beri or kakke presents paralytic symptoms from neuritis as a characteristic feature.

Of the cases that are appended, Cases 1 to 6 were due to alcoholic indulgence. The evidence of this was generally pretty definite. Case 1 was a gentleman of some means, who had lived a fast life and had been sent out on a voyage under charge of the captain in a cargo-vessel, it was said, in order that he might be under some control, and kept from excessive indulgence. Whether this is the most efficient way to secure the desired end may be doubted; it was scarcely successful here. In Case 2 the drinking was undoubted; he might have been described as "drinking himself to death." In Case 3 the patient insisted that he had only drunk at all freely about nine months before coming under our notice, but he had a large, rough liver extending nearly down to Poupart's ligament, with rather deep jaundice, and during the next year the liver contracted down to the margin of the ribs. Case 4 acknowledged to drinking pretty often for "faint feelings" and lowness. She was languid, dull, stupid, with morning vomiting, and had a large liver. Case 5 served at a refreshment bar, and was known by her friends to have drunk. Case 6

[1] 'New York Med. Rec.,' Feb. 5th and 12th, 1887.

had taken a good deal of spirits since the death of her husband three years previously; the feet were slightly œdematous, and the liver reached an inch below the umbilicus.

Case 7 presents many resemblances to the alcoholic cases, but the history of alcohol is only hearsay, and there is no evidence of cirrhosis. The sensory symptoms were very variable, and would have led one to put much of her trouble down to hysteria but for the unequivocal evidence of the muscular atrophy and the electrical reactions.

In Case 8 the origin of the disease is rather obscure, but the history of rheumatism and lumbago, and the attack of pain in the right great toe, suggest the possibility of a gouty origin.

Case 9 was that of a girl aged fifteen, who was admitted under my care for chorea, and she was treated with increasing doses of Liquor Arsenicalis. She was ordered nine minims daily on November 11th, fifteen on the 15th, twenty-one on the 22nd, and thirty minims on the 30th, thirty-six minins on December 3rd, and forty-five minims (nearly half a grain) daily on December 14th. This dose was maintained till January 10th, although the irregular movements had ceased by December 17th. On January 8th paralytic symptoms were noticed. It is natural to attribute the neuritis to the arsenic, but it does not seem to me to be conclusive, in view of the large number of patients that take doses of arsenic of this magnitude for corresponding periods of time without harm, and of the fact that arsenic is a drug to the effects of which tolerance can be acquired. The cases of arsenical paralysis on record seem to have resulted mainly from acute poisoning, or from taking large quantities of solid arsenic repeatedly, or from arsenical wall papers, and rarely from its administration in ordinary medicinal doses. Thus Dr. Stevenson ('Guy's Hospital Reports,' vol. xx) speaks of a case in which three quarters of a grain was taken repeatedly, and one of Dana's cases ('Brain,' January, 1887) took half an ounce of Fowler's solution (= 2 gr. of arsenic) three times a day. Still no other cause can be found, and just as the effects of alcohol are by no means always proportionate to the dose in different individuals, so here it may be that this patient was unusually susceptible. It will be observed that she took the full dose

of forty-five minims daily for less than four weeks before the paralysis was observed.

In Case 10 the symptoms must be attributed to cold. They developed at once after very definite exposure, rapidly reached their worst, and comparatively quickly subsided.

In Case 11 the atrophic symptoms came on insidiously, actually while the patient was under treatment in the hospital; the antecedents were an attack of gout or rheumatism two years previously, hæmaturia, with some back pain, for some weeks, and pain in the left knee and leg, more or less since the arthritic illness. We have learnt that neuritis may follow gout, and one would be glad, therefore, to look upon this polyarticular illness as of that nature; and the hæmaturia might be open to a similar explanation as the result of uric acid irritation. But it must be allowed that the joint attack might have been rheumatism, beginning as it did in the knee, and quickly spreading to many other joints. Rheumatism, however, has also been recognised as a cause of neuritis, and it will perhaps be right to put this case in the category of rheumatic cases, rather than in that of gout.

On the *pathological anatomy* of multiple neuritis, I have nothing myself to report in the present communication. The only fatal case occurred in private, and no post-mortem examination was made. The changes in the nerves have been described by many authors, and specimens have been shown before the Pathological Society by Dr. Hadden[1] and Dr. Hale White,[2] and to the Royal Medical and Chirurgical Society by Dr. Finlay.[3] They affect the trunks of the nerves, sometimes in the middle part of their course, sometimes at their distal ends; and the nerve-roots, at least the anterior roots, seem to be always exempt. The change is sometimes *parenchymatous*, affecting the nerve structures themselves, sometimes *interstitial*, affecting the various portions of the nerve-sheaths; often the two structures are simultaneously affected, and it still remains an open question whether the change in these cases is primarily parenchymatous or primarily interstitial. The parenchymatous change consists of an atrophy or "dege-

[1] 'Path. Trans.,' vol. xxxviii, 1887.

[2] 'Path. Trans.,' vol. xxxvii, 1886; vol. xxxviii, 1887.

[3] 'Med.-Chir. Trans.,' vol. lxx, 1887.

neration" of the axis-cylinders, which may entirely disappear, and a breaking-up or segmentation of the myeline. In the interstitial form the perineurium and endoneurium are infiltrated with nuclei, and ultimately become much thickened by the development of new connective tissue.

Symptomatology.—The symptoms of neuritis are: Various disturbances of sensation, motion, and nutrition in the areas supplied by the nerves affected. The *sensory* phenomena consist of a sense of numbness and actual anæsthesia, deep-seated pains, tenderness on compression of the muscles, and tenderness of the nerve-trunks. The *motor* phenomena are in most cases weakness, or paralysis; in some cases ataxia of movement. The muscles are generally atrophied in proportion to their weakness, the electrical reactions are more or less perfectly indicative of degeneration, and the reflexes are lost.

The distribution of these lesions is very different in different cases of neuritis. They may be limited to one limb, or to the distribution of one nerve-trunk, but in the cases known as multiple neuritis, they are more general, or even almost universal.

Still it is rarely that the symptoms begin in every part of the body at the same time. Indeed, certain nerves appear to have an undue susceptibility to the morbid or toxic influences which are at work, and hence to become affected earliest, or most severely, or alone. Thus, in several groups of cases the nerves supplying the extensors of the hands or feet are chiefly affected. One of the first things noticed in the alcoholic cases is often the "dropped hand," and the "dropped foot." If the arms are extended prone, the patient is unable to raise the hand level with the forearm; similarly in bed he cannot lift the foot to a right angle with the leg, but it lies extended in a line with the tibia. This paralysis of extension was the prominent feature of Case 5, when she came first under notice, and it was present in Cases 1, 2, 3. In Cases 4 and 6 the dropped position was less obvious, though the implication of the extensor muscles was shown in other ways. In Case 9, which was certainly not due to alcohol, the dropping of the hand and foot was very marked from the first; in Case 10 a general paralysis was developed much more rapidly than is common in alcoholic cases, and the extensors were not at first especially

picked out. In Case 7 the extensors were chiefly involved, and the dropped hand and foot were very marked in Case 11.

In ordinary lead paralysis we are familiar with the selection of the extensors of the hands though the extensors of the feet are generally spared, and diphtheritic paralysis, though it frequently begins with paralysis of the soft palate or of the ocular muscles, generally soon affects the muscles of the lower extremities. This curious susceptibility of the extensor muscles is of very great interest, and I cannot think that the last has been said in explanation when it is referred to as inherent weakness of the extensors as compared with the flexors.

The interossei muscles are perhaps the next most noticeably involved. Their paralysis or atrophy was noted in Cases 1, 3, 5 of the alcoholic cases, and in Cases 9, 10, and 11. In severe cases the other muscles of the limbs are obviously affected. All the movements become impaired, the grasp is feeble, the limbs cannot be moved from the bed, or only with great difficulty. On the other hand, the muscles of the trunk do not generally show marked degrees of paralysis, though I must confess myself to not having examined every case with sufficient care as to this point to speak with confidence. The diaphragm is certainly sometimes paralysed, and this must lead to a fatal termination in some cases; probably this was so in Case 2. On the other hand, Cases 1 and 10 illustrate the fact that under favorable circumstances paralysis of the diaphragm may recover. As a rule in alcoholic cases the facial muscles are not affected. It has been observed that the face presents generally a marked contrast with the rest of the body, since it may remain plump and full when the arms and legs are reduced to mere sticks from atrophy of the muscles. This contrast has been remarkably well shown over a period of two years by Case 5, and also by Cases 1 and 3. But in Case 10 the facial muscles were certainly affected, the eyelids could not be closed with force, the lips remained separated by a narrow fissure, and labial consonants could not be efficiently pronounced. The condition recovered in a few days. The ocular muscles are not often paralysed, but they were in two cases recorded by Dr. Buzzard. The laryngeal muscles are not unfrequently paralysed. Case 1 was for a long time quite unable to phonate, but the voice returned

after some weeks' treatment. In Case 2 the voice had altered and his cords were not fully vibrated. In Case 3 I saw with the laryngoscope that the left cord was paralysed.

But the vagus may be affected in regard to other branches than those to the larynx, namely, its cardiac branches, and the result of this is that the heart beats quicker from diminished inhibition. In the first case I constantly noted that the pulse was 100 when the patient was quite at rest, and I was at a loss then to account for this acceleration. As he improved it dropped to 88. Case 3, and the case of paralysis associated with angina which I give below (p. 302), illustrate the same point. Of other visceral nerves the greatest uncertainty seems to attach to those controlling micturition and defæcation. In many cases it is recorded that these functions have been normally performed; in others involuntary discharge has taken place, and has appeared referable to the mental condition of many alcoholic cases rather than to the implication of the nerves locally. In four of the following cases incontinence of urine, or fæces, or both, was noted. They all belonged to the alcoholic group, and were the most severe cases; in the remaining two cases (Nos. 4 and 6) the symptoms were altogether much less advanced. In two of the cases with incontinence it might be difficult to say whether it was due to a special implication of nerves controlling these pelvic functions, or to the mental condition of the patients; these were Cases 2 and 5. The former was within a few days of his death, the latter was in a very dull and stupid condition when she first came in, and soon became so delirious that she had to be removed to a separate room. But six months later, when she was much more rational, she still had incontinence, and in Cases 1 and 3 the mental condition of the patients, though characterised by loss of memory and delusions, was not so dulled as to make it likely that they would ignore the sensations preceding defæcation and urination if they felt them. Still it is significant that these pelvic disturbances consist of incontinence and not of retention. The latter I do not remember to have seen, but it occurred in a case recorded by Dr. Grainger Stewart in the 'Edinburgh Medical Journal' for April, 1881; and one would expect it sometimes, if the pelvic nerves were

at fault, and were attacked indiscriminately in different cases. Cases 7 and 11 had urinary troubles of a different kind.

Ataxia.—Cases of alcoholic paraplegia have been divided into paraplegic and ataxic. Only one of the cases here recorded suffered at all from ataxia, and it is not certain that that was an alcoholic case; the movements affected the arms chiefly.

Sensory symptoms.—Anæsthesia. This was present in all, or nearly all, the cases. The one doubtful exception is that of No. 2, of whom I made the note that there was no anæsthesia, but rather hyperæsthesia. But I think it is possible that a more detailed examination at a stage of his illness when he was more able to give an account of himself, would have shown that the hyperæsthesia was deep seated, and that anæsthesia of the skin was actually present. The anæsthesia is often limited to the lower halves of the extremities, such as the hands and forearms, the feet and legs below the knees. The figure on page 333 shows the distribution in Case 8.

Painful phenomena are also very constant. The most frequent is pain on compressing or grasping the muscles; it is especially often noted in the calf-muscles, but also in the muscles of the forearms, thighs, and legs sometimes. It was well marked in Cases 2, 3, 4, 5, 6, 9 and 10, and in Case 5 it persisted for months, though gradually diminishing.

Tenderness on pressure of the nerve-trunks has been often observed but is not present in all cases. This was made out very distinctly in two of my cases, namely, No. 5, one of the alcoholic cases, and No. 10, the acute case that was probably due to cold. In both cases the ulnar and popliteal nerves were tender; it was very marked in the latter instance. In Case 6 it was rather doubtful; the disease was in an early stage, but the muscle tenderness was nevertheless pronounced.

Spontaneous pains, often of a shooting character, are often complained of. They were most marked in Case 5. In Case 3 there was much complaint of "cramps," "spasms" in the limbs, the nature of which it was difficult to make out. I remember some years ago the case of a medical man who was much addicted to alcohol, and ultimately died with facial erysipelas. He had considerable enlargement of the liver, became deeply jaundiced, and suffered for months excruciating

shooting pains in the lower extremities, which did not, however, prevent him continuing in more or less active practice. There can be little doubt now that these were the indications of a commencing neuritis in the nerves concerned. Case 10 complained of many paræsthesiæ; pains in the loins, back, and limbs; extreme restlessness; and very troublesome itching. Case 7 spoke in a very definite way of two kinds of pain: shooting in the sole of the feet and pricking in the legs. She had "shooting days," "numb days," and "smarting days," but her pains were in many ways different from those of most cases, being more variable, and more influenced by the attention that was paid to them. In Case 8 the symptoms began with itching, and then there were severe shooting pains. In Case 11 pains in the ankles, and pricking sensations are complained of.

The *reflexes*, superficial and deep, are diminished or lost as a result of multiple neuritis, and the cases here recorded present only one exception to the general rule; in Case 11 the knee-jerks are present, though the tibialis anticus and peronei show reaction of degeneration.

Muscular atrophy is another indication of the implication of the motor nerve-fibres. It is present in all pronounced cases. It was especially noticeable in Cases 1, 3, 5, 7, 9, 10 and 11; less so in Cases 4 and 8; scarcely at all in Cases 2 and 6. Of these last, Case 2 was rapidly brought to an end, probably by respiratory paralysis, and Case 6 was not in an advanced stage. The wasting is most often observed in the anterior tibial muscles, in the extensors of the forearms, in the interosseous muscles of the hands, and in the extensor brevis digitorum pedis (Case 7). In severe cases, the other muscles of the limbs are also atrophied in an obvious manner, but the facial muscles rarely. That sometimes the wasting may be very rapid is shown by Case 9. Her symptoms developed while in the hospital, numbness and weakness were first noticed on January 8th, and on January 17th it is stated that the extensors of the hands, the interossei, and the thenar eminences were much wasted. In Case 10 the muscles were noted to have become "more flabby" between the tenth and the fourteenth days after the commencement of the symptoms, and on January 11th, the twenty-second day of the illness, they were "dis-

tinctly wasted and flabby." In other cases it was less easy to say in how short a period the wasting may be seen, as the symptoms were more insidious in their development. In Case 11 there had been pain in one leg occasionally for several months, and more constantly for about three months, when first one foot, then the other, lost the power of dorsal flexion.

Electrical reactions.—With the exception of Case 2, all were tested with the current at some or other period of their course, and the majority showed altered electrical conditions, sometimes amounting to complete reaction of degeneration. The sensibility to the faradic current was lost or very much diminished in the most affected muscles in Cases 1, 3, 4, 5, 7, 9, and 11. The sensibility to the galvanic current was generally less than normal, a greater number of cells being required to produce contraction, and polar changes were noted in certain muscles in Cases 1 (ACC = CCC), 5 (ACC > or = CCC), 7 (ACC > or = CCC), 9, 10, and 11 (ACC > CCC).

In Case 3 the relation of ACC to CCC is not noted; in Case 4 polar changes were not present, and in Case 6 the continuous current was not employed for testing.

Another condition which probably depends on the nerve supply, and which may therefore be induced by the inflammation or degeneration of the nerves, is the "glossy skin." This was present to a remarkable degree in Case 3 over the whole of the body, and to a less extent in Case 5, where it was limited to the fingers and toes.

Associated conditions.—These are most common in alcoholic cases, and consist of the effects of alcoholic poisoning upon other parts of the body, especially the brain and the liver.

Patients with alcoholic neuritis may have suffered from delirium tremens, or may become temporarily delirious, without tremor (Cases 1, 3, and 5), but what is characteristic of their mental condition is loss of memory, with delusions as to time, place, and surroundings. These were all noticed in Cases 1, 3, 4, and 5.

Case 1 remembered little of the voyage during which he was first taken ill; some weeks after being under treatment he had a delusion that he had been out for a walk when he had not stirred from bed. Case 3 had a fixed delusion that his

enlarged liver was due to hydatid (he was a medical man), and that he had been tapped; his memory for recent occurrences was bad. Fifteen months after leaving the hospital he stated that he remembered nothing of what had happened while there, though he was never unconscious at any time of his residence. Case 4 never knew the day of the week nor the name or number of the street where she lived. Case 5 has been under observation now two years. Her memory was at first very defective; she had no idea of the day of the week, of where she had come from, where she was, who her doctors were; she could not say whether she had seen the sister of the ward or the clinical clerk that day, nor could she remember anything that had occurred to her only a few hours previously. At one time to nearly every question of the kind she merely answered, "I really cannot remember." When readmitted in June, 1888, she had no memory of the thirteen months spent, mostly in the same ward, in 1886–87.

The *liver* was enlarged in three out of the six cases that are certainly alcoholic. In Case 3 it reached nearly to the spine of the ilium; its dulness measured at first nine inches, and it gradually diminished until eighteen months later its lower edge was close under the ribs. In Case 4 hepatic dulness was made out two inches below the ribs, and the edge could be felt only an inch above the umbilicus. And in Case 6 the liver reached one inch below the umbilicus, and had a rounded edge, and a rough and tender surface. No enlargement of the liver has ever been noted in Case 5, but on her readmission in June last its dulness extended only from the nipple to two inches above the thoracic margin in the nipple line; this may be the result of atrophic cirrhosis, but one cannot be so confident that this is so, or that cirrhosis is present in the other three cases.

In the discussion on Dr. Finlay's cases at the Royal Medical and Chirurgical Society, attention was called by Dr. Hale White to the frequency with which the symptoms of neuritis were unattended with other evidence (*e. g.* in the liver) of the effects of alcohol. This idea does not at first sight seem to be borne out by the present cases, of which one half showed undoubted cirrhosis. On the other hand, one must remember that the presence of cirrhosis would always be a strong point by which to determine the diagnosis of a case; and thus of

cases in which no cirrhosis was present a certain proportion from insufficiently clear history might be put down to some other cause than alcohol.

The relation of the hæmaturia to the neuritis in Case 11 must at present remain doubtful.

Diagnosis.—For evidence as to neuritis one must look to all those symptoms that indicate that the transmission of motor, sensory, and trophic impulses is interfered with, and to the local evidence that the nerve-trunk itself is the seat of the lesion causing this interference. The symptoms are anæsthesia, shooting pains, tenderness of the muscles, weakness or paralysis, atrophy of muscles, modified galvanic reactions or actual reaction of degeneration; with this there is often, not always, tenderness of some of the nerve-trunks. If this occurs in one limb, the chief difficulty in diagnosis will be to distinguish it from other causes of lesion of one nerve, or two or more adjacent nerves, and from cases of anterior acute poliomyelitis or spinal paralysis (infantile or adult).

But the other causes of lesion of one nerve are really not often in operation, with the exception of injuries, which will be at once obvious from the history. Spinal paralysis is as a rule distinguished with no great difficulty. Sensory phenomena are not generally persistent; the case often begins with severe pain lasting three or more days, and anæsthesia may be present at the commencement, but as a rule the symptoms are confined to paralysis, atrophy, and electrical changes which develop more rapidly and certainly into characteristic reaction of degeneration than in neuritis.

It has been suggested by Kast[1] that when different muscles supplied by the same nerve give different reactions, the branches to these different muscles must be differently affected, hence there is probably a multiple neuritis. I do not think that in any of the cases recorded in the present paper that a question of spinal paralysis (poliomyelitis) would arise. When the symptoms extend to the four limbs, or the whole of the body, and develop rapidly, they are likely to suggest an acute myelitis; and no doubt in former days these cases must have been looked upon as spinal lesions. But a lesion causing paralysis of all four limbs must either be situate in the upper

[1] 'Deutsch. Arch. für klin. Med.,' 1887, vol. xl.

part of the cervical cord, so as to cut off all impulses from the brain to the lower cord, or must involve the greater part of the cord from top to bottom.

The first lesion would not fulfil the conditions found in multiple neuritis. A transverse lesion in the upper cervical region would indeed cause paralysis and anæsthesia of the parts below, but the anæsthesia would probably extend to the chest and abdomen, the reflexes would be present, exaggerated knee-jerks and clonus would be obtained, nutrition and electrical reactions would be little affected.

As to the second lesion, it is a question of experience as to how often it occurs, and whether it is compatible with prolongation of life for any long period. An extensive acute myelitis may be fatal in from one to four or six weeks; there is probably retention of urine, rapidly formed and perhaps extensive bedsores, serious implication of the respiratory muscles, with œdema of the lung and pneumonia. The anæsthesia here also is likely to be more extensive and complete than in multiple neuritis. If the cranial nerves are involved, as by paralysis of the facial muscles or anæsthesia of the face, as in Case 10, and in cases published by Dr. Buzzard, the case might still theoretically be one of myelitis extending to the medulla oblongata, but the greater the extent without fatal result and the more irregular the distribution of the lesions, so as to oppose the idea of an inflammatory lesion sweeping through the cord and medulla, the more would one incline to the view that the lesions were scattered amongst the conducting nerves (neuritis), rather than in the centre whence these nerves arise (myelitis).

In more slowly developing cases, and in the later stages of the acute cases, the persistence of sensory symptoms, the muscular atrophy, and the electrical changes are together much in favour of neuritis, unless it should be shown pathologically that it is a common thing to get extensive lesions of the cord both in its motor and sensory grey matter, without such lesions of the pyramidal fibres as would cause, in some part or other, rigidity and increased reflexes.

Case 10 is of great interest in reference to these points. The onset was quite sudden, beginning with anæsthesia in the extremities, followed quickly by paralysis of all four limbs,

of the diaphragm, and of some facial muscles; the muscles atrophied and lost some galvanic reactions, the bladder was not affected, and the bowel only by an easily manageable constipation; he had no bedsores. The imperfectly distributed anæsthesia, the paralysis of the facial muscles, and the subsequent muscular atrophy with altered galvanic reactions, make the diagnosis of neuritis much more probable than one of acute myelitis.

For somewhat similar reasons Cases 7 and 8 should, I think, be classed with neuritis. They were chronic in their course, with widely distributed, yet not universal, anæsthesia, various pains or dysæsthesiæ, weakness (with ataxy in one case), and atrophy with altered galvanic reactions.

Were there in each case a conclusive history of alcohol the diagnosis of neuritis might be considered as certain, but there is, at present, only a strong probability of undue indulgence in Case 7, and nothing of the kind in Case 8. In Case 9, whether the cause was arsenical poisoning or not, the resemblance of the condition to those of neuritis is, I think, sufficient.

I think it is very likely that in past times many cases of neuritis in women have been mistaken for hysterical or functional paralysis. The patients were generally women of from thirty to fifty years of age, they were unable to say exactly when the weakness came on, they sometimes had various ill-defined sensory disturbances, they were often able just to stand or even to walk a little, though they probably dropped rather suddenly, or were perhaps unable to go without a little assistance; and yet the case was incomplete as compared with a typical myelitis, and there was no bladder trouble, a fact of itself considered to prove the hysterical nature of the lesion, because hysterical women were said never to wet themselves. Some would perhaps say that because the patient was a woman therefore hysteria was more likely than anything else, and that if she could walk a little, that was almost a proof that she could walk as much as she liked. The value of the reflexes was then unknown, and galvanism had not reached its present position as a test of degeneration in nerve and muscle. Such patients were often kept at rest for a certain time, and were probably galvanized, and in course of time

they got stronger, a result which is of course compatible with their symptoms having been due to something else than hysteria. Case 7 here recorded ran a serious risk of being diagnosed as hysteria, but the loss of knee-jerks and the electrical reactions and obvious wasting soon established the certainty of structural lesions. I do not by this wish to say that there are no cases of hysterical or functional paraplegia, but I would urge that no case of apparently simple weakness of the legs should be put down as hysterical until the knee-jerks and other reflexes, the electrical reactions, and the bulk and consistence of the muscles, have been most carefully investigated.

While on the subject of the diagnosis of neuritis, and the differences which different cases may present, one is led to ask in what respect cases of diphtheritic paralysis differ from, and in what they resemble, other classes of multiple neuritis, especially the alcoholic form. Speaking from an experience of children—and it is much more common in children than adults—I should notice that in diphtheritic paralysis sensory disturbances are rare, that muscular wasting is not pronounced, that the palatal muscles, the ocular muscles, and accommodation are early paralysed, while we are often deprived of information as to the galvanic reactions by the difficulty of getting trustworthy results in young children. The palatal and ocular paralyses remain distinctive of the diphtheritic sequelæ, but a sufficient number of cases, especially among older patients, shows that the resemblance between the conditions of the limbs is very close. Dr. Bristowe published some cases in the 'British Medical Journal' for February 4th, 1888, showing the close correspondence that might be observed in many cases. An important point is no doubt the rapidity with which sometimes the symptoms pass away, so that atrophy of the muscles has scarcely time to become a prominent, or even a recognisable feature. In two cases recently under my care, H. G—, æt. 32, after a bad attack of diphtheria, first suffered from a numb sensation in the nose and inability to smell properly, and then had numbness of the fingers and toes. Fluids regurgitated through his nose. Numbness extended in the limbs nearly to the shoulder-joint, and to the upper third of the thighs. Knee-jerks absent, plantar reflexes absent, gluteal doubtful, cremasteric, abdominal, and

scapular present. Has pains in the limbs, aggravated by pressure on the ulnar and median nerves of both sides, on the popliteal spaces, on the external popliteal nerves at the head of the tibia, and on the calf-muscles. He is now just able to stand, but could not walk three weeks ago. The grasp is very feeble; dynamometer, right five pounds, left two pounds. Some wasting of arms and hands. The galvanic report is mislaid. He gradually improved.

J. W. B—, æt. 17, had a bad sore-throat, followed by regurgitation of fluids through the nose, dimness of vision, and weakness of the legs. When admitted, four weeks after the sore-throat, he could walk, but in rather an ataxic way, and after a few yards his legs gave way; his hands and feet were "numb" and "pricked," but sensation appeared normal to heat, cold, and touch all over the body, except in the toes. Dr. Pitt tested the muscles, and found good reaction to faradism, and the same to galvanism, except when applied to the abductor indicis in both hands, where ACC>CCC 4 ma., and the second dorsal interosseous, where ACC=CCC 5 ma. During the next four weeks he got weaker in both legs and arms, the reaction to the faradic current became less, especially in the legs, and the calves, tibiæ, and feet became tender to pressure. After this he gradually improved.

With these cases I may here record (imperfectly, it is true) one which I saw with Drs. Larkin and Bedford, of Trinity Square. It was possibly a diphtheritic paralysis, but the interesting points were that the throat affection was not typically diphtheritic, and that the paralysis appeared almost, if not quite, simultaneously with the throat lesion; indeed, his friends said afterwards that the first thing they noticed was that he had the greatest difficulty in dragging his legs upstairs. When I saw him first, he had been about a week ill with the sore-throat and weakness of the legs. The condition of the tonsils had engaged most attention, and quinsy and diphtheria had been discussed, but now the tonsils were both large, covered with mucus and saliva, and presenting yellowish spots here and there; the right tonsil was larger, and the gland at the angle of the jaw was prominent. There was no characteristic membrane, and the throat looked rather like that of scarlet fever; yet there was no rash, and the history was unlike that of this

disease. He appeared very prostrate, the pulse was very quick, 120, and small; but I was not led to thoroughly investigate the condition of his limbs. Five days later I again saw him. He was recumbent, the head slightly raised, the pulse about 110, the heart beating strongly; breathing noisy, and rattling as from mucus accumulating in the chest; occasional ineffective cough, which failed to move the phlegm completely. Respiration diaphragmatic and costal, but the former feeble. In speaking phonation was most imperfect; sometimes he got clear speech. The arms could be moved, but the grasp of the hand was feeble; the legs could not be moved at all. The muscles were a little tender. He said he could not feel below the knees, but the result on testing was doubtful. There was no doubt some sort of dysæsthesia. Galvanic tests were not employed. I advised carbonate of ammonia to clear the chest, and mercury and potassium iodide. Improvement began a few days afterwards, and he recovered quickly, for which the medicine had due credit.

Course and prognosis.—The prognosis of multiple neuritis must be considered as on the whole fairly good, if the cause can be completely removed. Of diphtheritic paralysis we know that the majority recover quickly, though a small minority die from asphyxia, or exhaustion from difficulty in feeding. Of the eleven cases here recorded, four have very greatly improved, if they are not completely cured (Cases 1, 3, 9, and 10). Two are probably in much the same condition as when admitted (Cases 4 and 7). One, Case 5, is after two years almost a hopeless cripple from rigidity of the joints, though there is no doubt that there has been very considerable improvement in the transmission of motor impulses, and recovery from painful sensations. Case 11 is still quite recent, and does not present many indications for a prognosis.

One died (Case 2), and of two I have not been able to gather any information since losing sight of them, respectively twelve and eighteen months ago.

Of the five alcoholic cases of which I know the results, two have made fairly good recoveries, one is improved but still paretic, one is crippled from stiff joints, but even now promising, and one is dead.

The course of Case 5 I believe to be somewhat exceptional;

it is the only one of the nine living in which I know rigidity of the joints to have ensued, and it ensued rather rapidly, that is to say, it began within the first four months of her illness. Every effort was made to prevent the over-extension of the feet by pillows, splints, stirrups, but the extreme pain which all these measures entailed rendered it impossible. Ultimately also, the arms and fingers became bent up and rigidly flexed. She lay like this for some months, but in course of time we realised that the power over her muscles was much improved, that she could bend and straighten the arm at the elbow to the full extent of the mobility of the joint, and that she could get very fair extension of the hands upon the forearms. This led me to hope that some good result might be obtained by breaking down the adhesions about the joints; the mobility thus obtained has not been preserved, and she has curiously lost some power of motion (*e. g.* extension of the hand) that she had before the operations, but I still hope that with patience and perseverance her condition may be much improved. Starr says that a permanent deformity has not been recorded.

Treatment.—The removal of the cause is a very important part of the treatment in a great number of cases, and in few more so than in the alcoholic varieties of neuritis. In Cases 3, 4, and 5, that were directly under my treatment for some length of time, alcohol was absolutely withheld; in Case 1 it was forbidden, and was, no doubt, reduced to a minimum, but I had reason to believe that the patient did induce his nurses to give him both wine and brandy. This was, however, before I was acquainted with alcoholic neuritis, and I was rather inclined to suppose that syphilis might have to do with the symptoms, though I was puzzled to localise the lesion, and believing that he had suffered from both forms of intoxication, alcoholic and syphilitic, I dealt with these possible causes to the best of my ability. Rest in bed and careful nursing are generally essential; when the symptoms are pronounced the patient cannot fitly go about; and in acute cases, like No. 10, it is obvious that rest is desirable. The attempt, even in mild cases, to walk off the symptoms can do no good.

As to the influence of drugs upon the condition of the neuritis itself, one hesitates to speak with much assurance.

The perchloride of mercury was given in Cases 1, 3, 5, 7, and 10, combined with iodide of potassium in the first three. In other cases, and in these also, tonics, quinine, cinchona, strychnine, and iron were given, drugs that may have had some beneficial influence on the local processes. Starr advises that salicin, salicylic acid, or the salicylate of soda should be given in the early stage as it is given in rheumatic fever, combined with potassium or sodium bromide. Direct local treatment of the nerves, as by fomentations, poultices, and anodyne or counter-irritant applications I have not generally employed, though they may be worth trial where the easily accessible nerves (*e. g.* ulnar or external popliteal) are the seat of shooting pains or of much tenderness. In the more advanced cases, which formed the majority here, this treatment seems less likely to be of value. Some troublesome symptoms will often require to be dealt with, for instance, pain and rsetlessness may need morphia injections; the local pains in Case 10 were relieved by liniments of belladonna and opium, and itching sensations by the use of a boric acid lotion. In this case also the temporary weakness of the diaphragm led to a threatening accumulation of mucus in the bronchial tubes, and this was very much eased by the use of carbonate of ammonia in hourly doses. I advised the same in the case of diphtheritic paralysis mentioned above, and I have little doubt it contributed to his rapid improvement.

In later stages electricity appears to be useful, and it was employed in several of these cases in the form of the constant current, applied to the wasted muscles. Massage was used in Case 10, and it was attempted in Case 5, but the tender state of the limbs prevented its being efficiently carried out. In this case also we had to take measures to prevent the contractures of the limbs, though without success. Again, the extreme pain induced by all movements of and pressure on the limbs made stirrups, splints, and other mechanical appliances intolerable, and serious contractions have ensued, which we have attempted to deal with by breaking down the adhesions under chloroform.

Case 1. *Alcoholic neuritis; paralysis and atrophy of muscles, with implication of diaphragm and larynx; mental disturb-*

ance; nearly complete recovery.—On September 9th, 1880, I was called to see Mr. X—, who was on board a vessel that had just returned from a long voyage. He had been a great drinker, and I understood that he had gone out on this vessel, which was a cargo-vessel carrying coals and rice, in order to be under the control of the captain, and to be out of the way of drink. Probably at one of the ports he obtained a quantity of spirits; at any rate, after a time he refused food, and scarcely took anything for days; he then had some sort of feverish attack and was stated to be delirious; but he seems to have been about. The feverishness then left him, and he remained much in the same condition as when I saw him in his berth.

On the following day he was taken into lodgings on shore, where I saw him with Dr. B. He usually lay comfortably in bed and could turn over readily, but there was considerable weakness of the lower extremities. He could lift them a little and feel when he was pinched. He made no complaint of any pain or discomfort, his respiration was quick, his chest heaving, and his diaphragm was obviously paralysed. He talked in a hoarse whisper and could not vocalise. He passed his water and motions into the bed, his temperature was normal, pulse 120. He took food freely; he had to be put on a water bed as his back was becoming sore. After a few days the diaphragm still continued paralysed, but his respirations were only 17, pulse 100, temperature normal.

On September 11th iodide of potassium was given in doses of ten grains three times a day, and was increased to fifteen grains with one drachm of Liquor Hydrag. Perchloridi on September 16th. A few days after this his voice was weaker and he swallowed with some difficulty; the movements of the chest continued the same, but a quantity of mucus accumulated in the throat, and his efforts at coughing were feeble and incomplete. At the bases there was a moderate amount of râle and wheezing. The nurse stated that he was delirious at night. The respiratory difficulty improved after a few days. On September 20th, the iodide was increased to twenty grains. I have no note of his mental condition when I first saw him, but he had a very indistinct memory of anything that occurred on his voyage. On October 2nd my note was

as follows: "He varies a little in strength and vicacity. He is still weak in his limbs, and aphonic. Diaphragm as before. Takes food well. The nurses, in spite of directions, have given him both wine and brandy. His pulse varies from 100 to 108, temperature normal, chest clear. He talks freely and remembers well particulars of his past life, but he cannot be trusted for the events of the last few weeks, and has a constant delusion that he has been out for a walk during the last few hours, on any day one speaks to him. The iodide increased to thirty grains." On October 14th "he can raise the legs from the bed by flexion of the thigh, but he has scarcely any power of extension at the knee, nor can he move the toes; he can feel very well, indeed is rather hyperæsthetic, and has especially pains in the joints on quick movement and in the muscles on pressure, especially the muscles of the calf; the arms vary much in strength; the grasp is still far from perfect, and he has pain in the elbow on quick extension. The diaphragm and larynx are still paralysed; tongue and appetite are normal. There is no patellar reflex nor plantar reflex. His mental condition is very similar. Dr. B. says he lost his delusion (of going out for a walk) for two or three days, but on the 11th he told me a story about his going downstairs to the door, which had never occurred."

18th.—I examined the larynx but saw only the epiglottis and ventricular bands. There were several attempts at retching, during which I never saw the vocal cords, and think therefore they must have been paralysed.

24th.—He moves his legs up and down quickly in bed, *i. e.* flexion at knee and thigh alternately, but he can only raise his foot very little from the bed; he can move his arms freely, put his hand to the top of his head, but does not take hold of the head of the bed well (extension and outward rotation). He appears to feel perfectly on the feet and legs and he not unfrequently calls the nurses now when he wants to pass his excretions. Tongue clean; appetite good; pulse quick as before; respiration entirely thoracic; no abdominal reflex. The legs are certainly more wasted than when I first saw him, and there is decided wasting of the interossei of the hand; he is full in the face and healthy looking. He managed to

phonate imperfectly, though decidedly, once or twice while I was with him.

31st.—Much improved; he speaks for the most part well and loudly; occasionally, however, the voice drops into the old whisper, or a cracked laryngeal sound. The legs are moved quickly up and down in bed, but scarcely raised from the bed in the extended position.

November 7th.—Voice continues to improve. He talks nearly all day, and the voice rarely drops. He eats and sleeps well. Bowels occasionally confined. He can lift his feet quite ten inches from the bed in the extended position. The interossei still look wasted, and he cannot separate his fingers quite widely, especially the middle from the ring. He has stood up on his feet for a moment supported on either side. Breath very offensive, teeth and gums not tender, but edges of gums reddened. No salivation, mercury stopped. Ordered Pot. Iod. ʒvj, Pot. Chlorat. ʒj, Tr. Calumb. ℥j, Aq. ad. ℥xij, ℥j t. d. s.

14th.—He is out bed sitting in a lounge chair. He lifts his legs up readily from the ground, but the feet still fall back or down as from weakness of the anterior tibial muscles. He can, however, stand with a little support, and can walk a dozen steps when held on either side. Patellar reflex is still absent. There is obvious wasting of the anterior tibial muscles.

20th.—Continues to improve, can almost stand alone and walk with only slight assistance. The pulse to-day is slower than I have ever counted it, viz. 88, and on quick respiration the diaphragm certainly acts, the abdominal wall distinctly advancing; with deep inspiration the abdomen sinks in, but then he obviously strains at the chest. I tried galvanizing both arms and legs; scarcely any result with less than fifteen cells; good results with twenty-five to thirty-five cells CCC, strong at thirty-five and good at twenty-five, and ACC almost equally strong with either number of cells. I could get no opening contractions with either pole up to forty cells. With the same number of cells, the forearms and hands were more lively than the legs, but I think the thenar and hypothenar eminences were less susceptible. Medicine to be taken once daily. If a fine day to ride out. Voice continues clear.

28th.—Can almost stand alone; walks much more naturally

than before. Can bend the foot on the leg better. With a faradic current I got sharp contractions of the arms and fingers, but no contractions in the legs, and only a slight contraction of the short flexor of the big toe; there was also a slight contraction of the thighs. His memory still fails; he does not know which days of the week he drove out nor the name of the place he went to; he said it was some lord's place, but it was really Finsbury Park. After this he got about, walked without sticks, and finally left for his home.

In January, 1886, I heard from his doctor that he was quite well in bodily health and recovered from the paralysis, but he adds, "His mind is hardly what it was before his illness, and his will is weak, especially in abstaining from stimulants."

Case 2. *Alcoholic neuritis. Death.*—On September 9th, 1885, I saw with Dr. Hanne, of Peckham, a tobacconist, who had been a free drinker, and had had two attacks of delirium tremens. For about three months he had been getting weaker in the limbs, and for a month he had been laid up. He could lift up his legs from the bed but he could not stand. The legs were tender to touch and pressure, and there was no knee-jerk. The attempt to elicit ankle-clonus gave pain in the calf. Sensation was retained, indeed there was hyperæsthesia. The arms were also weak, the grasp feeble, and when stroking or rubbing his face he did it with a dropped wrist, and he was unable to fully extend the hand. The facial muscles did not appear affected, and the eyes moved freely. The voice had been lately much altered, and he talked in a sing-song way without full vibration of the vocal cords. The diaphragm was paralysed; inspiration drew it up, and cough depressed it. The cough moreover was feeble and ineffectual. The optic discs were normal. He was beginning to pass water under him. The muscles, though thin, did not appear to be wasted to the same extent as in spinal paralysis. There was no blue line on the gums. He refused milk, beef-tea, and food, but craved for stimulants, especially beer. He died, apparently from asphyxia, four or five days later.

Case 3. *Alcoholic neuritis; cirrhosis of the liver; jaundice;*

delusions; nearly complete recovery (from the report of Mr. W. G. Swayne).—Z—, æt. 33, was admitted March 17th, 1886. Father and mother both living, aged sixty-eight and sixty-seven respectively. He has been married fifteen months. No history of illness. He has always been strong and healthy, but had one attack of "quinsy." Has suffered from slight attacks of congested liver with jaundice.

History of present illness.—He has always been a heavy drinker, taking often two bottles of brandy in a day, yet seldom drunk. Last month he became jaundiced, and has continued so. He also noticed numbness of his fingers, unsteadiness amounting to ataxia in his walk, with pains in the legs. For three years he has had morning sickness and refused his food. Last January he decided to give up all alcohol. Since then he has gone steadily downhill. He used to weigh 17 stones and has lost at least 3 stones. He continued at work till two weeks ago, when he came to town. He is said to have fallen down from his legs giving way.

Condition on admission.—Patient is above the average height, and strongly built; he lies on his back in bed in a helpless condition; his legs are paralysed, and also his forearms. The skin is markedly jaundiced; the liver is much enlarged, reaching below the umbilicus, and presenting a hard, granular surface; its dulness measures nine inches vertically. The chest is well formed, moves well and equally, respiratory sounds normal. The heart's impulse is in the nipple line; sounds are normal; the lips are dry; tongue white and furred in the centre. He has no appetite, and takes very little food. Urine acid, sp. gr. 1025. Bile constituents are present with mucus, and a trace of albumen.

Nervous system.—His mental condition is not quite normal; he has made statements about being tapped for hydatid and of echinococci having been found in the fluid withdrawn, but this is entirely false, although he states it in a most circumstantial way. Dr. Goodhart, who saw him for me at this time, writes, "He lies in bed quite helpless; his urine and motions pass under him. Both his forearms are powerless to do anything requiring muscular effort, he can flex a finger feebly, but only with effort. There is considerable wasting of the extensors and also of the flexors of the forearm, and the interossei and

other muscles of the hand are wasted and flabby. His forearms can be moved in a flail-like manner to some extent. Legs also powerless and flabby in muscle; reflexes all absent, not even the plantar reflex can be obtained. He complains of pains and spasm when moved, particularly in the hip-joint. No reason for this can be made out. Sensation, as far as can be ascertained in his mental condition, is decidedly impaired up to the margin of the ribs." Pulse 120, temp. normal. Ordered Pot. Iod. gr. x, Liq. Hyd. Perchlor. ʒj t. d. For some days he was troubled with the sensation he describes as spasms or cramps, especially at night.

March 29th.—Patient's condition much the same. Dr. Goodhart remarked that he looked slightly more jaundiced. He cannot sit up in bed, as he complains of intense pain in the middle of the posterior part of the thigh, which is worst in the left. On pressure two very tender spots in the gluteal region can be made out, one in each corresponding to the situation of the sciatic notch; that in the left is the most painful; he also complains of pain in the thighs on pressure. Ordered Pot. Brom. ʒss, Aq. Menth. Pip. ad. ℥j, o. n. ℞. Acid. Nitro-chlor. dil. ♏xv, Tinc. Cinchon. ʒss, Syr. Auran. ʒj, Aq. ad ℥j, ter die. Diet, chicken.

30th.—Dr. Horrocks tested the reaction of the muscles with faradic and galvanic currents.

With faradic current (*strong current*). *Right upper extremity.*—Action in arm, in flexors, and in hand-muscles, but none in extensors.

Left upper extremity.—Muscles of arm acted to strong current, but in forearm neither extensors nor flexors acted, nor thenar nor hypothenar eminences; slight reaction in index, only slight in other dorsal hand-muscles.

Legs.—No reaction in either lower extremity.

With galvanism. Lower extremities.—

CCC
ACC } Only slight reaction.

Upper extremities.—

CCC
ACC } Both flexors and extensors act.

April 1st.—He appears less jaundiced than when admitted, took a fair amount of food last night. Urine neutral, sp. gr.

1316, no albumen, blood, sugar, or bile. Motions natural in colour. Pulse 120, temp. 98·4°.

On the 7th he was ordered to be galvanized.

8th.—He still complains of pains in the arms and legs; he has from three to six fits of tremors.

13th.—Intelligence improved, but his memory is most defective; now he himself notices that he frequently makes erroneous statements.

The general feebleness is extreme, but not so great as it has been. There is still incontinence of urine and fæces of which he is conscious. The face is not wasted, the jaundice is well marked, but not so great as formerly. The wasting of the extensor muscles of the arm is more marked, and his arms are quite powerless, and when lifted up the hand drops helplessly. Anæsthesia is complete in the legs, and the muscles are tender. The legs lie helpless, extended, and cannot be raised. There is not so much wasting of the legs as of the arms. There is no sickness and his appetite is better.

16th.—The patient's condition seems better, but his mental state is not much altered; his memory is improved except for recent occurrences, and he says himself that he fancies he has hallucinations. He is still positive as to the tapping and existence of a hydatid, though he now states that it was done in the country. The hepatic swelling appears smaller, and dulness does not reach so far as it did by 1½ inches.

21st.—At 5.30 p.m. patient is speechless and cannot move his right arm even to the extent he has been able to recently; the muscles of the right side of the face appear powerless, but the tongue is protruded to the left. There is no loss of sensation in the tongue. He appears perfectly sensible and understands what is said to him.

22nd.—Dr. Taylor examined the larynx; the left vocal cord is almost paralysed, adduction being imperfectly performed the right cord acted fairly well.

23rd.—The symptoms noticed on the 21st have entirely passed off.

May 4th.—The paralysis is, if anything, more marked and he cannot move his arms so well as before. Sensation to a light touch absent below the elbow; he can feel a pinch, but only after the lapse of some seconds. There is great

wasting of the upper extremities, his thumbs lie in the plane of the palms and adducted, and there is extreme wasting of the abductor indicis. His lower extremities are more wasted than some weeks ago and the reflexes are all absent. There is some hyperalgesia of the affected muscles. The abdomen is flat and resonant except over the hepatic region, and there is no evidence of ascites. His sphincters are paralysed and cannot resist any but the slightest pressure. He has had bleeding from the gums, his voice is husky, monotonous, and weak, the pupils are equal and react normally; optic discs rather pale but normal, hearing not impaired; mental condition rather improved.

17th.—It is noticed that he can appreciate the difference between hot and cold objects over the whole of his upper and lower extremities, chest and abdomen, but he does not appreciate them so quickly at the distal extremities of his limbs as at the proximal. He feels a cold object more readily than a warm one. The chest does not move well in respiration; breathing is mostly diaphragmatic. The hepatic dulness measures one inch less than formerly that is, 6½ inches.

June 4th.—He states that a weak current of faradism now causes him more pain than one three times the strength a week or two ago. The vocal cords appear to come together better.

25th.—The muscles of the upper extremities react to eighteen cells of the galvanic current; those of the lower extremities do not react at all. Breathing is almost entirely diaphragmatic, the intercostal spaces sinking during respirations; sensation is slightly improved; the voice deeper and improved in quality.

July 7th.—Patient improved; he can flex his forearms by raising the arms from the shoulder, and can direct his hands to his mouth, though quite unable to move the hands on the forearms. He can also extend the forearms slightly when flexed; passive flexion at the elbow beyond a certain point is painful. The muscles of the leg and abdomen and condition of the voice are as formerly reported; his mental condition has improved; sight, hearing, speech, and taste are all good. In the extremities distant from the trunk tactile sensation is difficult, perception of heat and cold normal; the sphincters

are weak. Hepatic dulness measures 5½ inches, splenic dulness comes slightly in front of a line between the nipple and the tip of the eleventh rib. Jaundice much less marked. Urine free from albumen.

8th.—Left the hospital and went to the country. Still confined to his bed with directions to abstain from stimulants and to have limbs galvanized regularly. He was under the care of Dr. S—, from whom I heard some months afterwards that he was gradually improving. On October 4th, 1887, he visited me at the hospital and I made the following notes: He is able to walk strongly but with a little dropping of the foot. The action of his fingers is rather clumsy in more delicate movements such as buttoning his clothes, and his grasp is clumsy though fairly strong. He writes his name in a bold steady hand. He finds that he cannot do two things at once, such as talking to me and buttoning his clothes, and when he walks he has to look carefully where he is going like a child.

He says he remembers nothing of what happened while he was in the hospital, but he knew my face and says he remembered some of the nurses. He is still slightly jaundiced; the liver can be felt just below the margin of the ribs; it is hard, nodulated, and granular. Since leaving he has taken only an occasional glass of beer. He has been a little more free the last day or two and he thinks his skin is more yellow in consequence. He has been occasionally sick and has sometimes vomited blood. He says that up till a fortnight ago he could not write. With reference to the origin of his illness he again asserts what he told us in the ward, that until about a year before he was taken ill he was perfectly abstemious. I arranged to see him the following day to test his muscles with galvanism, but he did not appear.

Case 4. *Alcoholic neuritis; cirrhosis of liver* (reported by Mr. C. D. H. Rygate).—Bridget P—, æt. 36, was admitted under the care of Dr. F. Taylor on April 27th, 1887, for weakness of the limbs and shortness of breath.

The patient is married and has had five children, all of whom died whilst teething. She says none of them had snuffles. She has had no miscarriages.

Previous medical history.—She says she has always been well up to nine weeks ago, enjoying a good appetite, and living well. She has been accustomed to take a pint and a half of ale, in the summer sometimes more. When she exceeded the pint and a half it was to revive herself on account of a slight feeling of faintness. In the winter she usually drank rum or whisky, drinking on an average from two quarterns upwards, exceeding the two quarterns for the same reason as she exceeded the usual pint and a half of ale. She says these feelings of faintness came on very often during the day. This recourse to stimulants for their remedial effects has been going on for nine or ten years. During this time she says her appetite has been reasonable, but she also says she more often than not felt too faint to take her breakfast. She had occasional nausea and sickness of a morning. Menses have been regular, lasting three or four days. During the last three winters, on catching a slight cold, she has developed a troublesome cough, and her sputum has been thick, frothy, and streaked with blood.

History of present illness.—Nine weeks ago the patient began to feel unwell. She felt languid, low-spirited, and had a headache, morning sickness, and a bad appetite, sometimes taking only one meal a day, and always refusing her breakfast. She was also restless of a night, getting very little sleep, and waking up frightened in consequence of horrible dreams. She had a cold at the time, and lost her voice, and used to cough up a frothy, thick, blood-streaked phlegm. She went to see a doctor seven weeks ago, and improved under his treatment; he advised her to leave off her stimulants. She has not seen any blood-streaked sputum since Monday (April 25th). She still had recourse to the rum and whisky. She has had continued dull pains in her head across the frontal region. She has also had swelling of the feet and hands during the whole of this time, increasing during the day and decreasing during the night. She has been able to get about up to the last fortnight; since then she has kept to the house, moving about with difficulty from chair to chair. She has, during the last nine weeks, suffered from shortness of breath, with a tight feeling across the chest on the slightest exertion. She had a gnawing sensation in the middle of the chest. She has

got gradually worse, and consequently came up to Guy's Hospital. She was carried up to the ward in a chair.

Condition on admission.—Patient is a very fat, large, florid-complexioned woman, with black hair, grey eyes, and dilated venules on her cheeks. She lies in bed on her right side. There is a little fulness in her hands and wrists, and œdema of her feet and ankles and legs. In her hands there is congestion of the venules.

Respirations 20 per minute. Breath foul. Some dulness at both bases behind.

Pulse 70, regular, firm, and full; heart-sounds normal. Impulse in fifth space 1½ inches, internal to nipple. Pupils equal, react to light and accommodation. Conjunctiva of lower lid dark red. Lips dark red. Tongue coated with a greyish fur. *Abdomen* full, distended walls, rigid, no dulness to be made out. Liver dulness begins in sixth space in nipple line, and extends two inches below level of ribs. The edge of the liver can be detected an inch above the umbilicus, having a rounded edge.

Nervous system.—The plantar reflexes are late; knee-jerks absent. Sensibility over the feet, legs, hands, and arms diminished. There is weakness in the flexors and extensors of the feet and hands, and pain when the muscles of the arms and legs are pressed, and some tenderness of the nerve-trunks. The hands are half closed and the feet slightly extended. Patient says she cannot open her hands completely, but can keep them open when opened for her. Bowels open about three times a week. The condition of the muscles is not easily recognised, on account of the subcutaneous fat, but they are certainly flabby, and the anterior tibial muscles seem to be wasted.

April 28th.—Urine sp. gr. 1025. Deposit of urates, which clear up on heating; acid; no albumen; no sugar; no blood. Ordered Tr. Nucis Vomicæ ♏x, Tr. Cinch. Co. ʒj, Ex Aq. t. d. s.

May 3rd.—She complains of waking up frightened in the night. Appetite very poor. No nausea or sickness now.

7th.—There is marked loss of memory, patient not knowing the day of the week, and forgetting the number and name of the street in which she was living before she came in.

12th.—Her memory seems a little better, but she is very

dull and drowsy, and takes no interest in her surroundings.

17th (Dr. Horrocks's note).—"The muscles of the upper extremities respond to both currents, but not very strongly nor very quickly. There is no qualitative change (CCC, ACC_2, AOC_3, COC_0). In the lower extremities there is similar action in the muscles of the legs, but one cannot obtain any reaction to faradism in either quadriceps extensor, and only slight reaction to strong galvanic current (CCC). The muscles and skin seem to be flabby. Sensation to current quite normal."

19th.—Patient is much about the same; if anything, there is a slight improvement. Her grasp is, perhaps, a little better. She does not wake up so often of a night in a state of fright. Her bowels are regular. Urine sp. gr. 1018, acid; light straw colour; no sugar, albumen, or blood.

20th.—Ordered faradism to the arms and legs.

June 8th.—Gets up every evening, but can only sit in a chair.

10th.—Grasp of hands as tested with dynamometer, R. 11 lbs.; L. 6 lbs.

19th.—Still much pain on pressure of the calves, and sensation continues deficient over legs and feet, the external surface being worse than the internal. To-day both sides are worse than they have been.

23rd.—The grasp of the right hand appears to be rather stronger. Her memory is as much impaired as before, and she remembers nothing of what happens the day before.

July 8th.—Dynanometer, R. 11 lbs., L. 7 lbs. Condition much about the same. Has fed herself lately, but has to have her food cut up for her.

20th.—There seems to be an improvement to-day. Last night patient was able to get out and into bed by herself, and was able to stand with her hands resting on back of chair, though unable to do so before. The pain in her calves, she says, has gone, and she does not complain of pain in them even when pinched this morning, though she did so yesterday. Plantar reflex present. Knee-jerks absent. Memory is better; can remember her husband coming to see her last Sunday; can remember the address where she lives, also the day of the week. She left the hospital to-day.

October 22nd, 1888.—I saw Mrs. P— at her own home. She was able to walk from room to room with assistance from chairs and tables; she could not stand long by herself. She was unable to dorsally flex the feet beyond a right angle, but could lift the feet from the ground when sitting on a chair. The grasp of the hand was rather weak; extension of hands on forearms fairly good. Of muscular atrophy I could not speak with confidence, as she was so fat. A strong faradic current caused no contraction in the muscles of the legs, but good contractions in the interossei of the hands; I had no galvanic battery with me. Knee-jerk was absent, or very imperfect. She suffered no pains; the calves were not tender, nor the exposed nerve-trunks. The legs were numb; she could not feel light touches below the middle of the leg, and the prick of a pin was scarcely felt as pain. She said her memory was very bad, she could not remember what she had eaten to-day, nor what she had done. She did not remember who I was, or the name of the ward she had been in. She said her allowance of stimulant was three half-pints of beer a day, with a little whisky or brandy. She promised to take no more than a pint of beer daily, or abstain altogether.

Case 5.—*Alcoholic neuritis; loss of memory; delusions; contraction of limbs* (from notes by Mr. H. P. Ainsworth, Mr. Black, Mr. Pollock, and Mr. Russell).—G. W—, æt. 32, was admitted under Dr. Taylor's care September 29th, 1888.

Family history.—Her father was a publican, and died "with an ulcerated inside," aged forty-two. Her mother died of "apoplexy" ("bursting of a blood-vessel in the brain") at the age of thirty-three. Her mother's mother died in Camberwell Lunatic Asylum.

Previous history.—The patient has always been in the liquor trade. About three years ago she was in business for herself, after two years she failed, and this preyed on her mind a good deal.

History of present illness.—The patient drinks several glasses of beer daily, and also has a fancy for "brandy cold," of which she takes several glasses morning and evening. Her friends say that they never saw her worse for drink, and did not even know that she liked drink. Six weeks

before she left her situation (ten weeks ago) she complained of weakness in her legs, which forced her to rest a good deal when at business. Up to four weeks before admission she walked to the omnibus daily, rode to the City, did her work there, and returned home at night, the *only* symptom being weakness of the legs. Her legs became painful, and then the arms lost power and also became painful. She then began to wander in her mind and crave for brandy.

Condition on admission.—The patient is an ill-nourished woman; hair black and somewhat matted, face a little shrunken, with prominent nose and deep eyes, and skin dark coloured and mottled. Her arms and hands are markedly wasted on front and back, and she holds her hands flexed, with the third, fourth, and fifth fingers flexed, and the thumb and second finger extended. She cannot extend the outer three fingers herself, but they can be easily extended by pressure, and become flexed as soon as it is removed. She lies on her back in bed usually with her eyes closed. Her legs are separated to an angle of about 60°; she cannot adduct them herself further than this, and forcible adduction is very painful, but possible. She can *abduct* her legs easily, and does so when told to *adduct* them. The skin of the legs is insensitive to slight stimuli, but hyperæsthesic to pinchings, &c. Knee-jerk and ankle-clonus are absent, and the superficial reflexes are abolished. Her speech is thick and occasionally incomprehensible. Her mind seems to wander to things she has been doing formerly. She is unable to give any coherent account of herself, her relations, or her illness. She answers at random to questions, but if they are repeated she seems to understand, but even then not to give a sensible answer. She cannot undo a button, or button one. The motions of her arms are weak and wavering; though hungry, she allows her tea to stand near her without attempting to take it, saying that she cannot reach it. The pupils are equal, dilated, react sluggishly to light and accommodation. Urine and fæces are passed involuntarily. She has to be fed with a spoon. On the right side of her neck is an oval soft the tumour lying on sterno-mastoid.

Alimentary system normal, with the exception that the bowels are opened involuntarily daily; lungs normal, breath-

ings sixteen a minute, shallow. Heart-sounds normal. Pulse feeble, regular, and small. Liver dulness normal.

On September 30th she was delirious all night, shouting and singing. Twenty grains of bromide of potassium and fifteen of chloral hydrate were given at 1 a.m. She is drowsy to-day, and cannot pull up the bedclothes or reach her food.

October 1st.—The early part of last night she was again noisy, but was quieted by a morphia injection. This morning she lies quiet and apathetic, with occasional fits of shouting.

4th.—The patient's muscles were tested with electricity to-day.

Faradic current.—The anterior tibial muscles would not react to the strongest current available. The gastrocnemius and flexors contracted, but only with a moderately strong current. Neither the extensors nor the flexors of the thighs contracted, except the sartorius on each side. In the forearm some of the *extensors* contracted, but when those of the fourth and fifth fingers were stimulated with a strong current, those fingers became *flexed*. In the arms both extensors and flexors contracted with a strong current.

Galvanic current.—ACC was equal to if not greater than CCC in the anterior tibial muscles and extensors of thigh. A strong current was needed to produce a contraction. In the arms CCC was always the greater.

6th.—She has loss of common sensation almost all over.

12th.—The patient is better as to her mental condition, but she still mistakes people and imagines she has been out for the day, &c. She can extend the hands now, but not against any force: she, cannot, however, perform complicated motions, as pulling her sleeves down. For the last two nights she has had no morphia.

31st.—Ordered galvanism, 15 cells, to arms and legs, five minutes to each limb.

November 10th.—There is no improvement in the paralysis, and the feet are becoming inverted and over-extended; this is being counteracted as much as possible by sand-bags placed against the soles.

17th.—She has been taking Tr. Digitalis ℥x, Liquor Strychninæ ℥v, Quin. Sulph. gr. ij t. d. s. She is now ordered the digitalis, with Liq. Hyd. Perchlor. ʒj. She has

been quiet at night lately. The whole of her body is emaciated, excepting the face, which has not participated in the general wasting, but still looks pale. The left arm is very much wasted, and there is some rigidity, the elbow being held flexed. She cannot extend the left arm beyond an angle of 12°. The forearm is wasted, and on the extensor surface there is a hollow dipping in between the ulna and radius, produced by the wasting of the extensor muscles. As to the hand, the dorsal interossei are markedly wasted and also the palmar interossei. The hand is held in the position of drop-wrist; the index finger extended and placed over the thumb; she cannot flex it. The third, fourth, and fifth fingers are flexed and cannot be extended without moderate force, and when released resume their former position. She cannot grasp with either hand. The right forearm she can extend completely; the depression behind between the ulna and radius is not so marked as on left forearm. The interossei are wasted. The first, second, and third fingers are extended, and fourth and fifth flexed, and their position can be reversed only by force. Thenar and hypothenar muscles are wasted on both hands. The extensors of legs and thighs are almost useless. The feet, by their own weight, fell down into a position of talipes equinus. Hence some plaster-of-Paris splints were put on the ankles, and a little way up the legs. The hands and feet are much worse than on admission, and the wasting has increased, both of fat and muscular tissue.

24th.—There is not generally much tenderness of the nerve-trunk. Neither the ulnar nerve behind the internal condyle nor the brachial plexus was tender on pressure in either arm. The right anterior crural nerve was slightly tender on pressure at the level of Poupart's ligament. The left was not so tender, but some glands about there seemed to be painful. The right external popliteal nerve was a little tender, but not so the left.

December 2nd.—The patient is in about the same condition as regards the paralysis and wasting. Her mental condition is better, and she is brighter and more cheerful. Her memory is bad, but not always deficient. The forearms are more flexed than ever. They form an angle of about 25° to 30° with the arms, and the patient will not voluntarily bring them

straight. Considerable force being used, they can be approximated to the normal condition, but only with great pain; there seems to be resistance on the part of the patient in addition to contraction. The patient lies quite helpless and still in bed, and has to be fed by a nurse.

22nd.—There is pain on pressing in the popliteal space over the popliteal nerve. No pain, however, is elicited on pressing over the external popliteal nerve. Abdominal reflexes are present.

The following full report was made on January 5th:—The patient lies quietly in bed, without taking any apparent interest in anything around her. When spoken to about her removal from another ward, she does not remember it, still fancying she is in St. Mary's Ward in a hospital, the name of which she does not know. Her memory is, one night say, entirely absent; when spoken to she answers clearly and distinctly, but her replies to questions on her past history are: "I am sure I do not remember," "I really can't remember." Her expression is one of slyness and cunning. Her limbs are very much emaciated, and although she has been galvanised since October 31st, she has not been benefited at all, her condition really having become worse. The arms are kept by the side of the chest, with the forearms almost completely flexed upon them, and a little supinated. When told to move her forearm she can extend it through an angle of about 30°, and by passive movement this can be increased to 45° when the pain is too severe to move it further. Wrist-drop is extremely well marked; the fingers are all more or less flexed, the little fingers being the most marked; the thumbs are underneath, opposed on the right side to the middle finger, and on the left projecting between the middle and ring fingers. By passive movement the fingers cannot be completely straightened, and much pain is caused in attempting to do so. The lower extremities show well-marked ankle-drop; by passive movements the feet can only be flexed a little upon the leg, causing much pain; the toes are also a little flexed upon the feet, the legs and thighs are adducted, and the knees are straightened out. There is slight power in the abductors of the thigh, better marked in the right limb. The patient lies with the body in a semiprone condition on the left side; the

lower half of the body is somewhat twisted, so that the legs lie over to the other side of the bed. Pulse 92, regular.

Electrical reactions. Faradism.—The gastrocnemii contract. There is no result with the extensors of the leg, flexors of the forearm, biceps, or triceps.

Galvanism to left side.—

Gastrocnemii CCC > ACC.

Extensors of leg ACC > CCC.

Biceps of arm ACC > CCC.

Flexors and extensors of forearm. No result with ACC, CCC, COC, or AOC.

The galvanism gave the patient a great deal of pain. The skin over the limbs is anæsthetic, and when a pin is stuck in more deeply the patient cannot feel the sensation directly.

Over the chest and stomach there is no anæsthesia. There is no pain on pressing over the popliteal and external popliteal nerves on either leg, and very slight pain over the ulnar nerve on the left side against the olecranon.

Lungs and heart normal. Liver reaches to half an inch above the costal margin. Urine normal.

March 22nd.—Urine is passed involuntarily and unconsciously; bowels are opened regularly every day. There is tenderness over the external popliteal and the ulnar nerves at the olecranon. No tenderness over nerves of upper arm.

May 14th.—Urination is still involuntary and unconscious. The passage of fæces is also involuntary, preceded by some warning. The mind is perhaps a little clearer, the patient taking more interest in her surroundings, but the memory is still most defective, and on the whole progress on the mental side is hardly greater than on the bodily.

On November 8th, 1887, the condition was as follows: She lies almost helpless in bed, but is moved to a couch from time to time. She still keeps her fulness of face, but the limbs are very much emaciated, especially the thighs and the muscles of the calves. The arms are kept to the sides of the chest, the forearms flexed on the arms, and crossed partly over the thorax. The legs are fully extended. The left shoulder-joint allows a movement to a right angle with the body; the left elbow is fixed at an angle of 45°; the right elbow can be extended to 50°, and gives a little play

within that angle. The wrists can be flexed completely, and extended almost equally. The fingers are flexed, especially at the first phalangeal joints, which cannot be extended beyond a right angle, with the exception of the middle finger of the right hand; the thumbs are more freely movable. The patient can herself move her arms at every joint to an extent corresponding to the passive movements, extending the wrist to about 130°. She can extend the middle finger to a straight line with the hand. There is a slight tremulous movement of the fingers and the hands. The lower limbs can be lifted so as to be at a right angle with the pelvis. The left knee can be flexed almost to a right angle; the right knee only half that distance. The ankles are firmly fixed in the position of talipes equinus, but there is some lateral movement. The toes are rigid, the great toes strongly flexed. The thighs can be adducted and abducted freely by the patient. She can also lift the foot twenty inches from the bed. Her attempts to move the toes result in scarcely perceptible movements.

There is no pain over the large nerve-trunks. The muscles are not at all tender on pressure. Abdominal and plantar reflexes, knee-jerks, and elbow-jerks are all absent.

She has control over the bowels and bladder.

Her memory is very deficient, but when spoken to she answers cheerfully and distinctly. She knows she is in Guy's Hospital, in Mary Ward, but cannot remember the day of the month, or the year. Half an hour after her dinner she does not know of what it consisted. If asked many questions she usually breaks into tears. When told she was going to the Infirmary she cried a good deal, and said she wished to remain at Guy's.

The heart and lungs are normal. The urine is free from albumen.

November 9th.—Mr. Jacobson kindly saw her, and expressed his willingness to break down the adhesions in order to render the joints more mobile, but every arrangement had been made for her to go to the Infirmary, and she left on this day.

She was readmitted on June 8th, 1888, in much the same condition as on her discharge, with great wasting of muscles, most of the joints fixed or very limited in the movements, the knees and ankles extended, the toes flexed; the elbows and

finger-joints mostly flexed, and the wrists flexed, but with rather more play in them than in the other joints. Reaction of degeneration was well marked in most of the muscles of the limbs.

On the 16th, Mr. Jacobson broke down the adhesions of the ankles, and the joints of the right arm; and on the 24th the left arm was dealt with. The limbs were secured to splints; and on the 30th passive motion was begun. Three weeks later there was a good deal of passive movement possible, but the voluntary movement was still very limited. Passive movement has been kept up daily, and the feet have been placed in stirrups so as to keep them at a right angle.

On October 26th, the report is to the effect that she lies on her back much of the day with legs extended, and the arms by her side. She can stand on her feet supported on each side, but cannot walk. The extent of *passive movement* is as follows:—The arms can be moved forwards about 80° from the vertical, backwards 15°—20°, outwards from the chest 60°; rotation at the shoulder-joint is fairly good. The elbows can only be flexed to the extent of 10°; supination and pronation are very limited; the hands can be extended to a straight line with the forearms, but scarcely beyond. The thigh can be flexed on the body to 90° from the straight line; rotation of the hips fairly good, abduction and adduction about half the normal extent; flexion of the knees 45°; the ankles can be extended for about 30° from the right-sided position; extension and flexion of the toes is limited.

Her power of voluntary movement at these several joints is almost the same in extent as above recorded; that is she can move the limbs as far as the joints will let her, with the exception of the wrist-joints, in which curiously the power of extension is very much less than it was before the operations.

Case 6. *Early alcoholic neuritis; cirrhosis of the liver.*—In 1887 a lady, æt. 30, consulted me, complaining of weakness of the legs and swelling of the feet, which symptoms had been coming on gradually three or four months. She walked feebly, and sitting on a chair was unable to hold her legs straight out. The legs and feet were numb, and she often had shooting pains in the legs. There was moderate pain on

pressure in the calves. The finger-tips were numb, and the grasp was feeble. The dynamometer registered 15 lbs. with the right hand, 16 lbs. with the left. It was not very obvious that the trunks of the nerves were tender, certainly they were not so tender as the calf-muscles. The faradic current applied to the muscles of the left leg caused moderate contraction of the anterior tibial muscles; good contraction of the calf-muscles, and when applied to the external popliteal nerve, good contraction of the muscles supplied by it. She complained that her abdomen had recently enlarged, and on examination the liver was found an inch below the umbilicus, with a rounded edge, rough surface, and tenderness on pressure. She allowed that she had taken more spirits than was good for her; she was often sick in the morning, and her appetite had failed.

Case 7. *Multiple neuritis of doubtful origin; possibly alcoholic* (reported by Mr. J. W. Russell).—Emma H—, æt. 39, was admitted under Dr. Taylor, on July 17th, 1888.

Family history.—Her mother is alive, æt. 70, getting weak-minded. Her father and paternal grandfather had paralysis of the legs. She has nine brothers and two sisters, all fairly healthy. She has been married fourteen years, and has three children living. Two children died suddenly while quite young; one was a six and a half months' child, and died at two months of age. She had had one miscarriage. Her husband drinks.

Personal history.—She has never been robust. Has had scarlet fever and smallpox. As a girl she had difficulty in passing her water about four or five times in the year. Ten weeks after marriage she was treated for retention, "chronic cystitis with ropy mucus," and she was told that a renal calculus had probably passed into her bladder. About five weeks ago she again had some trouble in micturition, and the urine has been smelling strongly.

During her pregnancy she has been liable to cramps in the legs. Five years ago she had some numbness in the left leg. She has been a good deal worried by her husband's intemperance; and her friends say that she has herself been drinking.

Sixteen months ago she was pregnant and as usual suffered

from cramps in the legs and feet, but they were much worse than they had ever been before. Six months ago they were very much worse. She then began to be troubled with burning and shooting sensations, occasional numbness of the legs and feet, and violent twitchings. These often came on shortly after she got to sleep in bed, and would then continue all night. About the same time she occasionally fell down, without cause, the legs giving way under her. To these symptoms a feeling of numbness of the abdomen and genitals was added, and the last month she has noticed a "drawing sensation" in the left hand. The left foot and leg are slightly worse than the right.

Present condition.—She is thin, with fresh and rather fair complexion. She seems anxious about herself, her manner suggesting a neurotic temperament.

Nervous system.—Sensation is very deficient in both feet and legs equally. Pricked with a pin sharply she is doubtful whether she feels anything, and cannot localise it. Sensation is normal in the hands and arms. Knee-jerks are absent on both sides; wrist and elbow-jerks, slight, if at all. No ankle-clonus. The legs are deficient in power; she is unable to lift them from the bed when only slight pressure is put upon them to keep them down. The hands are fairly strong, but the right grasp is weaker than the left. Pupils react to light. Sight and hearing are good; speech is normal; and intelligence is not impaired.

Præcordial dulness is diminished, but the heart-sounds are clear. The lungs appear to be healthy. Pulse 116, small and weak.

The hepatic dulness extends from the sixth space to half an inch above the costal margin in front, and one inch above it at the side.

Appetite bad; bowels generally regular. Urine sp. gr. 1009, scanty but clear, unpleasant odour, alkaline with fixed alkali, no albumen, blood or sugar. The microscope shows a few doubtful pus-cells.

In the next few days the following further facts were elicited:

Electrical reactions. Faradism.—Contractility in both legs much diminished.

Galvanism. — Calf-muscles contracted fairly well, CCC > ACC. Anterior tibial muscles contracted imperfectly requiring at least twenty-six cells, ACC = CCC in both legs. Results complicated by want of control of patient. On testing with hot and cold spoons it is found that she could distinguish between the hot spoon, and that at the temperature of the air; could not distinguish between the hot and the ice-cold spoon, both being called hot.

Dynamometer.—R. 26 lbs., L. 17 lbs.

She complains of agonising pain in soles of feet and calves, and often screams out when she sees them touched, but will allow a good deal of manipulation when her attention is directed to other matters.

Optic discs normal.

On July 24th the urine was still turbid, alkaline, the blue colour of the test paper not discharged by heat; no albumen. The microscope shows epithelial scales, large masses of small round-cells cohering together, no scattered pus-cells, bacteria.

She complained frequently and bitterly of the pains in her legs in exaggerated terms, "cruel" and "agonising," but would bear a good deal of pressure when her attention was distracted. Her pains are of various kinds, and she has "shooting days," "numb days," and "smarting days." Complained also of sleeplessness, and want of appetite, but the ward-sister did not confirm this.

It was noted on August 9th that there was great wasting of the legs.

On the 15th each leg measured, 1 inch below the patella, 9¼ inches, round the centre of the calf the right leg measured 9¼ inches, the left 9 inches. The muscles were flaccid and wasted. The dynamometer (different from that previously employed) gives R. 35 lbs., L. 28 lbs. Her complaints continued much the same, and she was now often sick, and took little solid food. Dr. Horrocks examined her on the 22nd, and found the uterus retroverted and slightly prolapsed; not enlarged; freely movable; the pelvic viscera normal; no tumours. Some anæsthesia of the vagina, but the normal sensation of pain on pressing the uterus itself. He was of opinion that the pelvic troubles were a part of the general nervous condition, and not a separate local affair; and the

troubles of micturition were due rather to the walls of the bladder, or to the condition of the urine.

On the 31st the sickness had nearly disappeared. The patient seemed better in herself, and more hopeful. Urinary trouble persisted. Dynamometer.—R. 50 lbs., L. 30 lbs. In the evening she made an attempt to walk with assistance and walked two steps.

On September 10th, with the help of a chair, she walked some distance without great difficulty, and she was then quite free from pain. But pains returned again a few days later, especially in the soles of the feet, in the lower part of the abdomen, and about the genitals: here it was scalding.

On the 24th she had numbness of both legs up to the knees, of the left finger-tips, base of the hand, outer side of the arm; of the right arm to a less degree. She spoke of two kinds of pain, "quite distinct," shooting in the soles of the feet, and pricking in the legs. The muscles of the legs were much wasted and flabby, and the right extensor brevis digitorum was scarcely discernible.

Dynamometer.—R. 35 lbs., L. 30 lbs.

Electrical reactions.—A strong faradic current caused very slight contraction in the anterior tibial muscles of both sides, and in the short muscles of the left great toe, and rather slow contractions when applied to the left external popliteal nerve.

With galvanism rather strong currents were required in all muscles, and the following polar changes were noted:

Left gastrocnemii, 36 cells, ACC=CCC.
„ anterior tibial muscles, 30 cells, ACC>CCC.
„ extensor brevis digitorum, 30 cells, ACC=CCC.
Right „ „ „ 30 cells, ACC=CCC.

The patient left the hospital on September 26th.

Case 8. *Peripheral neuritis with ataxic symptoms* (reported by Mr. W. E. Tresidder).—Camilla J—, æt. 57, was admitted under the care of Dr. F. Taylor, February 18th, 1887.

Patient sought admission for general weakness in the arms and legs, especially in the right arm and leg.

Family history.—Father died of apoplexy, aged about seventy-seven. Mother died at change of life of consumption aged about forty-five.

Patient is one of eleven children; three died in infancy; the remainder were all very healthy but most are dead now from various causes.

Patient has three children alive and healthy; four died in infancy. She has had two miscarriages; the first was about a four months' child and it was her first pregnancy, the second was her third pregnancy and was a two months' child. The eldest child alive now, aged twenty-three, was her second. None of the children had "snuffles" or rashes when infants.

Previous medical history.—Has had scarlet fever, she says, twice, and once had a sore-throat and rash which she thinks was a third attack; she has also had measles and dysentery about three years ago. Patient says she is of a very nervous temperament. She considers herself a fairly healthy woman, sometimes suffering from weakness; at times she has suffered from mild attacks of bronchitis. She had an attack of jaundice about thirty years ago and became very yellow all over. For about a year or two before the present complaint commenced she suffered at times from rheumatism and lumbago, which were relieved by embrocations.

History of present illness.—About two years ago the patient began to feel an itching in the hands and back; at this time she did not feel weak; the hands and back were not red or inflamed, nor was anything to be seen. About a month after this she began to feel an intense pain in her right great toe; she compares this pain to that which would be caused if her great toe-nail were being drawn out. This extended up the leg, and was of a shooting character. Her right arm at the same time also became the seat of a similar pain up to the shoulder and across the back. At this time she also suffered from cold perspirations, so that the sheets became wet and had to be frequently removed. She also had had headaches and wandered in her mind a good deal. Sleeplessness also troubled her a good deal. Soon after this she began to feel weakness in the right arm and leg; this was first noticed in the arm as she was in bed and was feeling very ill, and she suffered at this time from spasmodic crampy pains in various parts of the body, chiefly in the stomach and chest. All these symptoms came on very gradually but consecutively, and in the first three weeks of her illness. After this, still

gradually, she felt a numbness in the left gluteal region and left side of the face and nose, and she fancied she lost the senses of smell and taste on the left side; the left forefinger was also numb. Now gradually the right arm and leg became numb and the loss of power on the right side was much increased, and she felt generally weak. At this time she was unable to pass her water, and had to have it drawn off twice daily for three days. She also suffered from constipation, which was relieved by enemata. She remained in bed for about five weeks, and the weakness when she got up was such that she was unable to stand without help, and was unable to sit up in a chair for very long, as she occasionally had fainting fits.

When she first got up, the pains in the limbs much decreased, but pain in the head still continued, and she suffered much from sleeplessness, which was relieved by opium. In this state she remained for some time, but gradually got slightly better, and was after about nine months able to walk again for a short distance (a quarter of a mile) without assistance, but she still felt very weak generally. After this, pain came in the left toes and heel, similar to that which attacked the right great toe, and the left leg got considerably weaker, the right, however, still remaining the most affected, and she was unable to get about so much as before. She at the time felt so weak that she was admitted into St. Bartholomew's Hospital, where for a short time previous she had been attending as an out-patient, and was treated by electricity about twice a week. Since leaving St. Bartholomew's Hospital she has gradually got weaker, so that at the present time she is unable to stand; the feeling of numbness has gradually extended to various parts of the body, the pains in the joints have increased, and pains in the chest and abdomen and limbs generally have appeared. She has also suffered from headache a good deal lately. When walking she used to feel as if she were treading on thick felt.

Present condition.—Patient is a very stout woman, with rather yellowish complexion. She is rather low-spirited, and has rather an anxious expression. She lies in bed on her back, unable to raise herself or to turn completely on to her side. She does not move much, and when she does move her

limbs she does so slowly. The vertebræ at the junction of the cervical and dorsal regions are rather prominent, but on pressing the spines of the vertebræ she does not feel any pain. When moving the right arm for the purpose of doing anything the hand does not move straight to the point, but goes through a number of irregular jerky movements of flexion, extension, supination, and pronation. When told to touch her head the hand takes a considerable time to do it, although all the time she is making great efforts. The remaining limbs, when they move, do so slowly, but the movement is not accompanied with any irregular jerky movements. The head remains quite steady when the patient is lying in bed and also when she sits up. There is no nystagmus. Both deltoids are very much wasted. The shoulder-joints can be felt as though there were little but skin covering them. The muscles all over the body are very flabby, they feel like so much fat, and have completely lost their tone. She has a good deal of pain in the limbs and joints, shoulders, elbows, wrists, joints of hand, also in the right temporo-maxillary joint, in the hips, knees, ankles, joints of toes and feet. She also has pain in the palms of the hands and soles of the feet, in the muscles of the arms, forearms, and calves of legs; the character of the pains in the joints is gnawing, sometimes shooting, intermittent, much increased by moving, so that patient is compelled to cry out sometimes on being moved.

Sometimes when going to sleep she suddenly wakes with a start, feeling great pain in various joints.

She has not much pain in the chest to-day, but sometimes she feels a sense of tightness, as if something were bound around the chest; she also has a feeling of tightness sometimes around the forehead and knees.

The speech is somewhat slow, but there is no tendency for it to be syllabic or scanning. The voice is not thick, but seems natural. The pupils are equal, and react to light and accommodation. The sight is very good. The sense of smell is good and has quite recovered on the left side. She thinks she still does not taste well, but she sometimes has a metallic coppery taste in her mouth. When eating the food seems to adhere to the teeth a good deal, so that patient has to remove it with her fingers. She swallows well. The ends of the

fingers have a glossy, shiny, smooth look, and the nails are rough on the surface. The ungual phalanges are over-extended. The patient thinks she has got much thinner in the forearms, and the legs are very flabby, but these, she thinks, have not wasted. There is marked anæsthesia over various parts of the body, and patient feels very numb all over. There is marked anæsthesia on the right forearm corresponding to the shaded part in the accompanying figure. The left forearm is also anæsthetic below the bend of the elbow, more markedly than the right. The right leg as far up as the middle of the thigh is completely anæsthetic to slight touches.

The left leg is not anæsthetic to slight touches, but it feels numb. There is no loss of sensibility to pressure, that is, when any part is pressed with moderate firmness. There is no analgesia or hyperæsthesia or sensibility to temperature. Patient suffers a good deal from cold, and suffers every now and then from shivering fits. The superficial reflexes and tendon-jerks are lost all over the body. The muscles do not react to the faradic current; the extensors of the forearm, the peronei muscles, and the muscles of the calf have the reaction of degeneration to the galvanic current, viz. the contraction to ACC is greater than that to CCC. The joints are

not swollen, red, or inflamed. No pain on passive movement, but when moved forcibly in any one direction pain is elicited. There is creaking in the knees and right shoulder, but not in any other joint. The ligaments of the ankles and right wrist seem very lax. No pain on jarring the heels. The left elbow has been sprained, and cannot be manipulated on account of the pain caused thereby. The tongue is protruded to the right side.

Alimentary system.—The teeth very irregular; upper incisors lost. Tongue clean. Patient finds difficulty in digesting meat, and chiefly lives on farinaceous food. Abdomen exceedingly fat and flaccid, resonant all over. Liver dulness small, extends for about two or two and a half inches in nipple line, is not absolute for more than one inch vertically, the note for the rest of the extent being very tympanitic. Spleen normal. Bowels regular.

Circulatory system.—Cardiac dulness small and not well defined; does not extend below the fifth rib: impulse not perceptible. Sounds normal. Pulse 80.

Respiratory system.—Inspiration is sometimes sighing and catchy. Slight cough and expectoration of mucus. Physical signs normal.

March 1st.—Patient is complaining of great pain in knees, ankles, and shoulders of an aching character, and she has had some diarrhœa since she has been in, but it has now stopped. Patient also complains of feeling cold, although her hands do not feel cold to the touch.

11th.—There are some slight ataxic movements in the left arm, and the patient is unable to move it much. She attributes it to a sprain. The muscles are not painful when grasped firmly.

16th.—There is anæsthesia of the face to light touches, and patient says her face feels numb and she has a sense of tightness across her forehead. There is no facial paralysis, she can hear and see well.

18th.—Liq. Hydrarg. Perchlor. ♏lxxx, Mist. Cinchoninæ ad. ℥j t. d. s.

21st.—Patient complains of cramp in limbs and of feeling cold.

Dr. Horrocks tested the patient with galvanism and writes,

"Muscles act to both currents in upper and lower extremities. No qualitative changes."

25th.—Mist. Bismuthi Subnitratis ℥j t. d. s.

31st.—Patient says she is weaker, has great difficulty in turning over in bed, and has a feeling of stiffness about the neck and face. Numbness of the face is getting worse; it is more marked on the left than the right side. She has cramp in the abdomen after taking food; her appetite is bad. Pil. Doveri gr. v, nocte.

April 2nd.—Omit bismuth and continue the mercury.

4th.—Omit mercury. Mist. Ferri Tart. ℥j t. d. s.

5th.—Aq. Menth. Pip. ℥j t. d. s.

7th.—Patient is much the same, the arms are quieter. She complains that her right leg is very numb.

13th.—She has been very sick lately. The arms are steadier, and she can move the legs better than when she came in. The feeling of numbness in the legs, arms, and face is much the same.

18th.—Ordered fifteen minims of Vinum Colchici in Calumba, and on the 22nd ordered three minims of Fowler's solution, with five grains of iodide of potassium.

29th.—The arms are a little more wasted, but not so ataxic. On attempting to get up the other day, she was unable to walk.

May 4th.—Went out to-day in very much the same condition as on admission, but with somewhat less ataxia.

Case 9. *Multiple neuritis, paralysis, atrophy, anæsthesia, following chorea treated with full doses of arsenic* (reported by Mr. T. O. Raw and Mr. C. D. H. Rygate).—Annie M— æt. 15, was admitted for chorea under Dr. Taylor's care, on November 10th, 1886. She first had an attack of chorea when she was twelve years old, and was in Guy's Hospital for a second attack in June, 1885. She has never had rheumatic fever. The present attack began six weeks ago, and is now of moderate intensity. There is a soft systolic murmur at the apex, not heard behind, but a murmur is audible in the pulmonary and aortic areas.

On November 11th she was ordered three minims of Liq. Arsenicalis three times a day. This dose was increased to five

minims on the 15th, to seven minims on the 22nd, to ten minims on the 30th, to twelve minims on December 3rd, and to fifteen minims three times a day on December 4th. The chorea improved quickly; on December 9th she is reported to be nearly well, on the 17th it is stated there are no irregular movements. The medicine, however, was continued in the same dose until January 10th, two days after her paralytic symptoms were first noticed.

January 2nd, 1887.—Patient has to-day some sore-throat, and pain around the angle of jaw. The throat is seen to be slightly red and injected; she also says she feels very unwell.

8th.—She complains to-day of numbness in the hands and feet and her grasp is not strong.

14th.—The hands and feet still feel numb and her hands are very weak; the right hand is almost useless, the left is a little stronger, but when asked to grasp one's hands, she does so with only two fingers and the thumb; the other fingers become weakly flexed on the palm. She has not any choreic movements of the hands now, she has no difficulty in swallowing, she speaks plainly, she has slight cough. Her forearms and hands are rather tender and painful when grasped. Her legs are also very weak and painful. She complains of numbness in the feet, which are very tender. The knee-jerks are absent. When trying to obtain ankle-clonus it hurt her so much that I had to desist. She is unable to stand, and when set in a chair she slips off on to the ground.

17th.—Patient is about the same. The grasp of her right hand is very weak, hardly perceptible, that of her left hand is a little stronger. The extensor muscles of both arms and the interossei and thenar muscles are observed to be much wasted. She can pronate and supinate her forearm and flex the forearm upon the arm when midway between pronation and supination. She is unable to hold her hands out straight; when trying to do so her hands drop and her fingers fall apart. She has hardly any power over her right thumb, is able to adduct it just a little but not to abduct it. She has a little more power over the left. She has no loss of sensation in the arms. The muscles of the legs are also wasted and are painful when moved about. Both her feet drop the same as her hands and she is unable to extend them. Knee-jerks

and plantar reflexes are absent. The ankle-joints are too painful to try for ankle-clonus. There is slight anæsthesia in both legs, rather more in the right. The bowels are pretty regular, and she has no trouble with her bladder.

Ol. Morrh. ʒj t. d. s., two eggs. Fish, port wine ʒiv.

19th.—Mist. Ferri Tart. ʒss t. d. s.

February 1st.—Patient is a little better. She has more power over her right arm and her grasp is a little stronger. She has pains only when her limbs are grasped firmly. Knee-jerks still absent. She can just extend her hands at the wrists, but is unable to hold them straight for any time; she is unable to dorsally flex her feet. She has no trouble with her water. Urine pale colour with a small deposit of mucus, acid, sp. gr. 1025. No albumen, sugar or blood.

5th.—On testing the muscles of the legs, there was no reaction at all to faradism, but in both legs with galvanism there was a little ACC, but no other contraction.

24th.—Patient is now just able to extend her right hand on her forearm; when doing so she keeps her fingers apart. She is able to adduct her thumb a little, but is not able to abduct it. Her grasp is much stronger than it was, and she has more control over her hand. She has no pain on pressure. She is still unable to flex her feet on her legs, and any attempt to do so gives her pain. Knee-jerks absent; pain on deep pressure in calves. No anæsthesia. No trouble with her water. She is now able to stand up when resting both arms on a chair, but cannot walk.

March 1st.—Both the patient's wrists still drop, the right being at an angle of 160° with the forearm, and the left at an angle of 170°. The grasp of the left is much stronger than that of the right, but it is still weak. She is able to close the fingers of the left hand completely, but can only, in closing the fingers of the right hand, get the tips of the fingers to the palm. She has no power of abduction or adduction over the thumb of the right hand, and she gets only partial abduction of the left thumb, but complete adduction. Her feet still remain extended, and she has no power over them. When they are flexed by others she complains of pain as a right angle is approached. The legs are much wasted. There are no knee-jerks and no ankle-clonus.

17th.—Dr. Horrocks saw the patient and made the following notes:

"Muscles of hands do not react to strong faradism; those of forearm act a little. Muscles of legs act scarcely at all to faradism. To galvanism the muscles of forearm act peculiarly. There is a great deal of anodal opening and cathodal opening relaxation. In legs there is a little ACC and no CCC." He recommended the continuous current, anode to spine, cathode to be brushed down arms and legs five minutes each daily (current = 1 ma.).

19th.—She is able to-day to walk five steps, dragging the feet along the ground, and can stand up for a minute by herself.

25th.—The patient gets stronger. There is no hyperæsthesia or tenderness of the muscles, and no tenderness over the nerve-trunks.

April 2nd.—The patient is getting stronger, she can now get about the ward, but drags her feet.

18th.—She has gone out to-day. The grasp of the left hand is stronger than that of the right; the adductors of the right thumb are very weak. She is still unable to flex the feet upon the legs. Knee-jerks still absent. Since she has been paralysed there has been a marked growth of thick black hair over both legs, but on the arms the hair is more downy, and not so thick.

October 12th, 1888.—At my request Annie M— visited me at the hospital. She had continued weak for some time after leaving; but the last six months the improvement has been considerable, and, so far as the power of walking is concerned, she may be said to be well; but she still has a little choreic twitching of the hands. The grasp is accordingly not very strong, and the interossei look wasted, especially the right abductor indicis; the calf-muscles have grown considerably since she left the hospital, and there is no indication of atrophy in the leg-muscles; but dorsal flexion of the right foot is not quite perfect, and there is a little want of play about the ankles generally. Mr. J. Fawcett kindly tested the muscles with galvanism, and obtained the following results:

		Right.	Left.
Arms.	Extensor communis digitorum	ACC>CCC	CCC>ACC
	Dorsal interossei	ACC>CCC	ACC>CCC (3rd & 4th) CCC>ACC (1st & 2nd)
	Thenar eminence	CCC>ACC	ACC=CCC
	Hypothenar eminence	ACC=CCC	ACC=CCC
Legs.	Tibialis anticus	CCC>ACC	No reaction
	Extensor longus digitorum	CCC>ACC	No reaction
	Peronei	CCC>ACC	No reaction
	Calf-muscles	CCC>ACC	CCC>ACC

Case 10. *Multiple neuritis following exposure to cold; paralysis of limbs and facial muscles; dysæsthesia; rapid improvement.*—A. B. C—, æt. 42, an officer in the army. On December 20th he took a long railway journey of seventy miles or more, returning the same day. On arrival home he noticed numbness of his fingers and feet. This continued the following day. Nevertheless he went skating with his son, and went through a good deal of exertion in teaching the boy how to skate. Still the numbness continued, and was no better on the 22nd and 23rd. On this day or the 24th his legs gave way under him and then his arms were found to be weak. From that time till his coming under my care on December 30th he has scarcely been in bed, but can only find comfort in an armchair, and then requires to be shifted and altered in position literally every five minutes. His weakness increased and was at its worst on the 29th. During the last twenty-four hours he has been a little stronger. He has been seen by Dr. Collison-Morley, and by Sir Andrew Clark in consultation; he has had quinine in effervescence, and counter-irritation along the spine. He came to the hospital (private ward) in an ambulance, and I saw him at 8.15 p.m. and made the following notes:—"He is sitting in an arm-chair, the legs are very weak, and he cannot lift the right leg at all; he can flex the left leg moderately at the thigh, knee, and ankle, and extend it again, but the movements are feeble. The hands and arms can be moved, but he can scarcely grasp; he just brings the tips of the finger and thumb together. He cannot raise the arms above the

head. There is a good deal of facial paralysis; neither eye can be completely closed, he cannot grin or show the teeth thoroughly, he cannot put the lips together to whistle, and in talking he cannot give B or P distinctly, but sounds them as V. His breathing does not seem to be impaired; on coughing, which is feebly performed, he appears to contract the abdominal muscles well. Phonation seems perfect, but the failure of cough seems due to weakness of the larynx. Central vision is good, but there is diplopia at the limits of the field. Sensation is lost in the lower extremities nearly up to the umbilicus; the fingers and hands are also numb.

"He complains of pain like electric shocks, running up the legs if they are moved, bent, or straightened at all suddenly. He has marked tenderness along the inner side of each arm, at each inner condyle, along the inner side of each forearm, above the clavicle on the left side (not on the right), in the popliteal space on each side and over each gastrocnemius muscle; the feet are slightly swollen and pit on pressure. The bowels have been constipated, and were opened by an enema yesterday. Urine passed normally, free from albumen. Pulse rather feeble, not quick. Temp. 97·6°. Hitherto he has slept very badly, being constantly roused by pain or discomfort in his back, loins, limbs, and indeed all over him. He was placed on a water bed and I ordered him Chloral Hydrate gr. xxx, Pot. Bromide gr. xv, nocte; and Pulv. Doveri gr. v, post horis quatuor."

December 31st.—He had passed a restless night, unable to turn about on the water bed, and constantly wanting to be moved; complaining of thirst and a dry tongue. Ordered quinine, and bromide of potassium in an effervescing ammonia mixture. At 6 p.m. he was very bad, his chest filled with mucus, which he was unable to expectorate. Temp. 100·4°, pulse 120; begging for relief from the chest and constantly being moved. He is now on a mattress. Ordered Ammon. Carb. gr. v, secundis horis. Four hours later he was much relieved; chest cleared and breathing more comfortable.

January 1st, 1887.—He was very delirious in the early morning, but slept more or less during the night. Respiration is noisy, but the chest is clear. Muscles are still tender. He moves the right leg better, bending it at the knee. He

shuts the eyes closer than before, the right eye not quite. He moves the right leg better and bends it at the knee. No reflexes can be obtained; the feet are numb, but he feels. Late in the afternoon he was taken with severe pains in the loins, reaching to the front of the abdomen and down the thighs; they almost make him cry out. He appears to suffer intensely, and is constantly asking to be shifted from side to side, or up and down in the bed to relieve the pains. They were somewhat relieved by a morphia injection, and he slept two hours, but the pains recurred in the early morning.

2nd.—The pains and the difficulty of breathing are his troublesome symptoms. Morphia relieves the former, but rather aggravates the obstruction of the chest. The ammonia was given for a time every hour. He coughs with much greater force and effect than formerly. He now speaks with no noticeable labial failure, and uses his arms freely. In the legs he cannot feel slight touches, but can when firm pressure is applied.

3rd.—The muscles appear to be more flabby than on the night of admission. Abdominal and plantar reflexes are absent, there is no knee-jerk, and no clonus. A hot spoon is recognised as hot, but transmission is long delayed, especially when the spoon is applied to the inner side of the ankle, less on the side of the leg. He has had no twitchings, no spasms, no hyperæsthesia of the skin. Inj. Morph. Hyp. $\frac{1}{3}$ gr. at night.

4th.—Condition very much the same. He had one and a half to two hours' sleep after the morphia, then woke up restless, with pains in the loins, legs, &c.

5th.—Grasp distinctly stronger, though not yet a grip; the left hand a little better than the right; he can close the right eye completely, so as to see no light through. He now lies flat on his back; expectoration of phlegm is still a prominent difficulty. Temp. 98·6° to 99°. Pulse 100. Resp. 24. Optic discs normal.

7th.—Complains of intense itching in various parts of the body, especially back, loins, and thighs. Twice had a chill with sweating, which he called ague.

8th.—Numbness up the middle of the back to the neck, and over the lower ribs at each side, not over the scapula.

9th.—Can be moved with less pain, and is more free from pains in the loins and muscles. Cough is still troublesome, but is eased by a spray of soda and ipecacuanha wine. Dynamometer.—R. 2 lbs., L. 1 lb.

11th.—The legs can be moved or straightened with much less pain; the muscles of the calf and front of leg are distinctly wasted and flabby; they are still tender on pressure. He suffers much from his hands, which feel intensely cold whenever he touches anything except flannel; a newspaper, book, or any like thing gives this cold sensation.

12th.—The muscles of the legs tested with electricity: Good contraction to faradism, moderate to galvanism. CCC = ACC about.

15th.—He moves his legs very much better; can lift the right leg from the bed, straighten the knee, adduct and abduct pretty freely. He has had much trouble from constipation from time to time. The mucous accumulation in the chest is much less, and the itching is much relieved by a boric acid lotion (twenty grains to the ounce).

19th.—Dynamometer.—R. 17 lbs., L. 15 lbs.

24th.—He is gradually improving. Dynamometer.—R. 30 lbs., L. 32 lbs.

25th.—Was in an armchair for an hour or two, even rested on his legs for a short time in passing from chair to bed.

26th.—Galvanic reactions:

Right forearm, 27 cells	ACC > CCC
„ „ 30—50 cells	ACC = CCC
Muscles of the thumb, 50 cells	ACC > CCC
„ „ „	AOC slight
„ „ „	COC nil
„ „ 42 cells, contractions only just noticeable	
Third dorsal interosseous, 42 cells,	CCC > ACC
Muscles of thigh, 42 cells, extensors	ACC > CCC
„ „ „ adductors	ACC = CCC

30th.—Shaved himself for the first time.

February 1st.—Can stand to dress himself, uses his hands freely, but cannot grasp a pen to write. Obvious wasting of muscles between thumb and finger.

2nd.—Dynamometer.—R. 47 lbs., L. 40 lbs. This was after walking about pushing a chair before him.

9th.—He left the hospital.

His temperature was irregular, though never very febrile. On December 30th, the night of admission, it was 98°, the following night 101·2°, and it gradually feel during the next three days to normal on January 4th. Except for a single rise to 102·2° on January 6th, it remained normal or subnormal until January 16th, and thence till the 31st, it was between 98·4° and 100°, with single rises to 102°, 101·7°, and 101·4°, on the 21st, 28th, and 29th respectively. During February till his departure it was normal.

The treatment was mainly symptomatic. Morphia controlled the restlessness, and gave sleep. Carbonate of ammonia every hour or two relieved the accumulation of mucus in a marvellous manner. Local pains were relieved by opium and belladonna liniment, and itching by boric acid. On January 8th quinine was given, and on the 13th perchloride of mercury and iodide of potassium. From January 14th onwards, faradism was used to the legs, thighs, arms and hands daily.

On November 7th, 1888, he kindly called on me. He was quite well, but considered himself to be not quite so strong as he had been formerly. The dynamometer gave R. 100 lbs., L. 90 lbs., and from his physique and the bulk of his muscles, which showed no trace of atrophy, I should certainly have expected more. The electrical reactions were perfectly normal. He stated that for three months after leaving he continued weak, and then rapidly improved. For some time he suffered from severe cramps in his calves and in the muscles of his jaws.

Case 11.—*Multiple neuritis, affecting arms and legs. Previous joint attacks (rheumatism or gout?) and hæmaturia.*—W. H—, æt. 44, was admitted on July 16th, 1888, into the Clinical Ward under Dr. Perry, and was transferred on October 5th to Stephen Ward under Dr. Taylor.

(From notes by Mr. J. Fawcett.) His father and mother died at seventy; the father suffered from gout. Up till two years ago the patient was quite healthy; he then had an attack of "gout," which lasted for six weeks. It first attacked the left knee, then the right knee and ankle, then

both wrists and elbows slightly, and some of the finger-joints. All the affected joints were swollen and painful, and the skin over them used "to shine like glass." No history of syphilis, lead, or undue use of alcohol.

Present illness.—From the time of this joint attack till the present the patient has been very well, except for an occasional aching pain in the left knee. In May last this aching was very severe, with pain shooting down to the foot and up to the hip, increased by pressure on the leg. A week after this his urine became thick and dark, and he had pain in the back, sometimes enough to double him up. No pain in passing it, but sometimes delay in starting the stream. The urine got darker until his admission. The pain in the knee continued, and often kept him awake at night; but he was able to walk up to the hospital, and on his admission had no loss of power. After admission, the hæmaturia continued only ten days. Three weeks later the pains in the legs got worse, he had a constant aching in the ankles, and he was unable to rest. In four weeks' time the toes of the left foot dropped, and then the ankle. Two weeks later the right ankle dropped. Since then he has had constant pricking sensations in the legs; and they get very hot at times, especially at night. He himself observed that the legs have wasted since coming in.

On September 11th the following galvanic reactions were noted. All the contractions are slow.

In tibialis anticus both sides and left peroneus ACC > CCC. In extensor longus digitorum and right peroneus CCC > ACC.

In dorsal interossei of hands and abductor indicis, both sides, ACC = CCC.

On admission under my care, he is old-looking for his age; mental faculties unimpaired; speech, sight, hearing, taste and smell normal.

Both legs are in a position of extension, and he is unable to bend at all the ankle of either foot (dorsal flexion); he can, however, lift up the leg against a fairly good resistance. The arms are weak; the dynamometer registers, R. 10 lbs., L. 25 lbs.

The muscles of the legs are atrophied, they are flabby and small, and the tibiæ project unduly. The interossei of the right hand are much wasted, and the flexors and extensors of

the forearm are flabby and small; the left interossei and forearm-muscles are similarly affected, but to a less extent.

Galvanic reactions are as follows:—In the tibialis anticus of both sides ACC > CCC. In the extensor longus digitorum and peronei no reaction. In the interossei of hands and abductor indicis of both sides, ACC > CCC.

Reflexes.—Knee-jerks well marked, no plantar reflexes, other reflexes present.

Sensory phenomena.—Aching pains in the ankles, and in the little finger and thumb of the left hand; sensation of great heat in the skin of the legs, while the knees are cold; pricking sensation in the feet, worse at one time than another. Tactile sensation:—An impulse is very slowly conveyed at times, but he can localise points well, except along the inner side of the little finger of the right hand, where more pressure has to be employed. There is no pain on pressure over any of the nerve-trunks or muscles.

The heart and lungs are healthy, the liver appears to be of normal size. The urine is acid, clear, sp. gr. 1016, free from albumen. He has never had any trouble with it since the cessation of the hæmaturia.

October 12th.—Faradic current:—No reaction in the muscles of the legs. The dorsal interossei of both hands act fairly well, and also the extensors of the forearms, and the muscles of the thenar and hypothenar eminences; the latter less than the former. He is taking perchloride of mercury internally, and is still under treatment.

ON A CASE

OF

ANEURYSMAL VARIX OF THE THIGH

OF FIVE YEARS' STANDING

TREATED BY OPERATION.

By N. DAVIES-COLLEY.

Arterio-venous aneurysms are so rare, and there are so few recorded instances in which those of the lower extremity have been submitted to operative treatment, that the following case seems to me worthy to be included in our 'Hospital Reports.' It has been delayed for several years in the hope that I might make it more complete by following up the history of the patient after he left the hospital. Unfortunately, I have as yet been unable to trace him out, and I therefore publish the case in a somewhat imperfect form, not without hope that in doing so I may be also adopting the best means for obtaining some information about his subsequent history. There are also some points in the pathology and etiology of the disease, which seem to me to be incorrectly described in the medical literature to which I have had access. I propose, therefore, after giving the report of my patient, to call attention to these points, and also to speak of the operative measures which were adopted in the treatment of the case.

The report has been compiled, partly from my own notes, and partly from those of my ward-clerks, Mr. Walter Fowler and Mr. R. A. Baillie, and I have also had considerable assistance from my late dresser, Mr. Lockhart E. W. Stephens, who was indefatigable in the attention which he paid to the case.

Adolph J—, æt. 37, married, a Swedish sailor, was admitted into Guy's Hospital under my care on November 24th, 1881, with a pulsating enlargement of the upper part of the left thigh. Five years before, he and two of his mates were shooting with a revolver at nuts on a table, when one of the shots glanced off the table and went through his left thigh. The bullet must have traversed the thigh from without inwards, in front of the bone, at the junction of the middle and upper thirds. He remembers feeling the shot strike him, and seeing the blood gushing out at the bottom of his trousers, and he then became unconscious. He does not know how the hæmorrhage was stopped. The wound healed up in about three weeks. Between two and five days after the injury he noticed some local pulsation, and a swelling where the bullet had emerged. His leg below the knee also became weak and stiff, and he complained of pain, shooting down the inner side of the limb, and into the great toe. He came into the Dreadnought Hospital one month after the accident, and was also a patient there upon two subsequent occasions. At one time an elastic stocking was applied there, and at another his thigh was flexed and a tourniquet was employed for a short period to compress the artery. In Sweden, two years ago, he was treated on five different occasions by the application of an Esmarch's bandage for nearly two hours at a time. With the exception of these intervals of hospital treatment, he has been able to go on with his work as a sailor; but during the last two years he has suffered from increasing weakness of the limb, and the beating sensation, which extends up into his abdomen, has become more and more oppressive. Otherwise he has always enjoyed good health, except that he has suffered occasionally from rheumatism for two or three days at a time.

On admission, he was of the middle size, with a light complexion and fair hair; somewhat lean, but muscular and well formed. His face was much sunburnt from a recent voyage to India.

He had two scars on his left thigh at the junction of the middle and upper thirds, upon the same level. The one on the front of the thigh, at which it would appear that the bullet entered, was 7½ inches below the anterior superior spine; the other, at the inner side, was 4 inches below the spine of the pubes. The former was in the middle of a brown patch of skin ¾ to 1 inch in diameter, which he said that he had always had. Both were about ¼ inch across, and not much puckered.

From Poupart's ligament down to the middle of the thigh there was a distinct fulness along the course of the great vessels, but no defined tumour could be seen or felt.

The pulsation of the femoral artery was unusually perceptible, and it was accompanied by a peculiar vibratile thrill, especially in the upper third of the thigh. This thrill could be traced upwards to a point two inches above and a little to the right of the umbilicus. Below it extended into the popliteal space.

The internal saphenous vein was slightly varicose and prominent as far down as the middle of the leg, and some vibratile pulsation could be felt in it.

Pressure upon the femoral artery at Poupart's ligament diminished both the swelling and the thrill, but the latter could still be felt. Both the anterior and posterior tibial arteries could be felt, but it was noticed that the beat of the latter was weaker than upon the opposite limb.

The circumference of the left thigh at the points of entrance and exit of the bullet measured 19¼ inches, of the right at the same points 19 inches.

The circumference four inches above the patella was on the left side 15¾, on the right 15¼ inches.

The circumference of the calf was on the left side 13, on the right 12½ inches.

The circumference two inches above the internal malleolus was on the left side 8½, on the right 8 inches.

The circumference of the heel and instep was on the left side 13, on the right 12½ inches.

The measurements of the left limb were therefore almost uniformly half an inch more than those of the right.

The left leg and foot were appreciably colder to the touch

than the right. In cold weather he said that he felt much colder on the left than the right side. The skin was desquamating, tense looking, and thin on the left side, but there was no œdema. That of the right side was normal.

A loud bruit, resembling the rumbling of machinery in motion, could be heard wherever the thrill was felt. It was continuous, but it increased in loudness with each beat of the heart. It could be heard as far as the umbilicus above and the popliteal artery below, and transversely for 2¼ inches on either side of the swelling, and also at the lower part of the back. The general health was good, and there was no albumen in his urine. He had a scar on the inner side of the left upper arm, which looked like that of a tertiary syphilitic ulcer. It came two years before of itself.

On the 29th, Dr. Goodhart examined his heart, as it had been noticed that the precordial dulness was increased, and the apex-beat somewhat abnormal. He reported, "I do not think there is any evidence of dilatation or other abnormality of the right heart. But the heart itself is not normal. The impulse extends to the sixth interspace, and is 1½ inches outside the nipple line. At this spot the action is jerky, thick, and prolonged. There is at times almost a murmur. There is also a diffused, almost musical systolic murmur audible down the sternum from the third to the fifth ribs. This might be due to some tricuspid hampering, but I am disposed to think it is more probably due to some slight aortic valve thickening, and that the mitral sound and displaced impulse indicate some general endocarditis of chronic form, probably dependent upon his work. There is no history of rheumatism."[1]

After consultation with some of my colleagues, I decided to ligature the superficial femoral artery above and below the communication which we believed to exist between the artery and the vein at the site of the old injury.

December 2nd, 1881.—His thigh having been shaved, and a compress of lint soaked in carbolic acid lotion having been applied on the previous day, chloroform was administered, followed by ether. A vertical incision 6 inches long was made,

[1] This does not agree with the reporter's notes, vide p. 348, but as the patient was a foreigner he sometimes misunderstood questions.

down to the sartorius. Its centre was half way between the two scars, and rather to the outer side of the artery. On lifting up the inner edge of the muscle, a large, strongly pulsating vessel was exposed. Its diameter at the upper end of the wound appeared to be about $\frac{5}{8}$ inch. Opposite the middle of the incision it widened to nearly an inch, and from being cylindrical above, it was here marked by a shallow, longitudinal groove, as if it were about to divide; but lower still it became again cylindrical, and its diameter was reduced to $\frac{1}{2}$ inch or a little more. I was at first in some doubt whether the vessel which I had exposed was the artery alone, or the closely adherent artery and vein. I carefully dissected through the connective tissue or sheath covering the vessel above and below, but could make out no division. The artery, as it proved to be, was of a reddish colour and looked like alarge, thick-walled vein. From its size and colour it closely resembled a congested piece of small intestine. Putting my finger upon it above, I could feel that the blood rushed through it downwards. So I passed an aneurysm needle round it, from within outwards, and compressed it with my finger. All pulsation at once ceased below. Again, when I lifted up the vessel with the needle, I could feel behind it something vibrating but not pulsating, which I took to be the femoral vein. I therefore threaded the needle and encircled the artery with a piece of No. 4 catgut. Without tying this, I passed another piece of the same catgut round the lower part of the vessel. This I tied first, and then the higher ligature, both with a double twist of the first knot, followed by two other knots. I next cut off the ends of the ligatures at $\frac{3}{8}$ inch from the knots. The pulsation at once ceased, but a slight vibration still remained in the part between the ligatures, which alone could be felt. On pressing the thigh just above the knee, this vibration disappeared.

Not more than an ounce of blood was lost during the operation. Six silver sutures were inserted. Oiled and dry carbolic gauze was then wrapped round the limb, and the parts below were swathed with cotton wool. The operation was performed under carbolic-acid spray, and lasted about an hour. An hour later he had recovered from the ether, and felt no pain. The foot and knee were warm. Later still the

same evening, the dresser, Mr. Stephens, could feel the dorsalis pedis pulsating. The foot was rather cold, so he put on some warm flannel.

3rd.—He has been quite comfortable. Some discharge had come through the gauze. First dressing. About an ounce of bloody serum without smell upon the gauze. I could still feel vibration between the ligatures, but nowhere else. He said the beating had quite gone. Evening temp. 100·6°.

4th.—He slept, and feels much better. Morning temp. 99·2°, evening temp. 100°.

5th.—Feels comfortable. Has only had milk. Bowels not yet open.

Second dressing. Apposition good. ℥ss of bloody serum without smell. Foot and leg warm; I can feel no pulsation in the dorsalis pedis. At first I thought the thrill had also gone, but at last I could perceive between the ligatures a faint vibration like that of a kettle just beginning to boil. There was pulsation also of the posterior tibial artery. Morning temp. 98·6°, evening temp. 99·4°.

6th.—Morning temp. 99·6°, evening temp. 98·4°.

7th.—Third dressing. ʒij to ʒiij of bloody serum without smell. Some swelling. I can feel no thrill. Says he is a little numb on the inner side of the knee, but I find that he can feel there. Bowels not yet moved; enema ordered. Morning temp. 98·4°, evening temp. 99°.

8th.—Morning temp. 98·4°, evening temp. 99·4°. Bowels opened by enema. Some headache.

9th.—Fourth dressing. ʒiij of bloody serum without smell. Thin film of blood-clot over incision ¼ inch broad. Morning temp. 98·8°, evening temp. 99·2°.

12th.—Fifth dressing. ʒss of bloody serum without smell. Some thrill.

15th.—Sixth dressing. Thrill to be felt at one spot between the ligatures. The pulsation of the femoral artery ceases an inch above the upper extremity of the wound. Some can be felt below on the outer side of the limb.

19th.—Seventh dressing. All remaining sutures removed. About ℥ss of bloody serum. Blood-clot ½ by ½ inch at upper third, looks as if covered by epithelium.

24th.—Pulsation in posterior tibial.

29th.—Ninth dressing. ʒij to ʒiij of bloody serum without smell. Wound healed over with the exception of a patch of granulation ½ by ¼ inch, which has taken the place of the blood-clot.

Pulsation can now be felt down to ½ inch below the upper end of the wound. Thrill to be felt over a space two inches in length, extending downwards from an inch below the upper end of the wound. This thrill is synchronous with the pulse elsewhere, and is barely, if at all, perceptible between the pulsations.

Early in January boracic acid lint and ointment dressings were substituted for the carbolic gauze. A few drops of pus were now seen on the granulating surface, the only evidence of suppuration yet observed.

On the 11th, a few days after the wound had entirely healed, I found him in great anxiety, and he told me that the upper ligature had given way, for he could feel the artery beating in his body. On uncovering the parts I could perceive a much more distinct thrill than I had observed since the operation. It was continuous, but at the same time it increased considerably with the pulsation of the artery. I could control it by pressure upon the artery at Poupart's ligament. The dorsalis pedis could be felt, but not the posterior tibial.

As it was evident that the upper catgut ligature had given way, and that the vessel was again patent, I decided to reopen the wound and apply a fresh ligature.

On the 13th, six weeks after the first operation, he was again placed under ether, and I proceeded to open the upper two thirds of the old wound. All the parts were closely adherent, and I was unable to separate the posterior surface of the sartorius from the sheath of the artery. I was therefore obliged to carry my incision about 1½ inches higher. The artery was without much difficulty exposed. It was about ⅜ inch in diameter, the coats were somewhat thick and rough, and it was adherent to the sheath. On attempting to pass the aneurysm needle round it I had to divide a thin layer of membrane, and as soon as the ligature had taken the place of the needle it was evident that this membrane was the wall of the femoral vein, but adherent to the artery. Free hæmorrhage followed from the two openings

into the vein, and it was not fully controlled until Mr. Bryant, who kindly gave me his assistance, had drawn forward the artery and vein together. I was now able to dissect away the tissues above and below for a short distance, and to place a strong carbolized silk ligature round the artery and vein together, both above and below the puncture, with an interval of three quarters of an inch between them. The two ligatures were considerably above the original communication between the artery and the vein. All bleeding at once ceased, and there was no more thrill to be felt. Gauze dressings were applied as before. He lost about a pint of blood during the operation, and he was somewhat blanched and faint at the end of it.

During the short administration of chloroform which preceded the ether he had once stopped breathing, and after the operation was finished artificial respiration had to be again used to restore his breathing. Two days after this operation his temperature rose, and in a short time he became weak and low.

On the 19th there was nearly ℥j of purulent serum without smell upon the dressings, which had been left for two days untouched. He was much depressed, and felt sure that he should die.

On the 23rd he refused to take any food, as he was under the delusion that his attendants wished to poison him. Nutrient enemata were given, and the next day he was reassured by a visit from a Swedish clergyman, who drank some of his milk for him to show that it was not poisonous. From that time he began to improve again.

27th.—The last of the sutures removed. The wound, which had gaped, is now contracting. There is no œdema about the leg, nor has there been since the operation.

February 6th.—Granulating wound 4 by ¾ inches. Discharge very foul. A very faint thrill is now perceptible at Poupart's ligament. Health improved.

8th.—Mr. Stephens, the dresser, examined carefully for pulsation in the limb, and ascertained that it could be felt in the lower part of the anterior tibial and in the dorsalis pedis; less distinctly in the posterior tibial; and upon firm pressure in the popliteal also. Measurements of the left leg were at the tubercle of the tibia 11⅞ inches, round the calf 11¾ inches,

an inch above the ankle 8 inches, and from the point of the heel round the instep 12¼; as compared with 10⅞, 10¼, 7⅝, 12 inches at the corresponding points of the right side.

11th.—Morning and evening temperature normal.

16th.—Wound 2½ by ⅝ inches. Discharge still somewhat foul. Health good.

23rd.—Boracic acid dressings.

March 15th.—One of the silk ligatures came away.

24th.—Martin's india-rubber bandage applied to the limb below the wound.

30th.—Up in wheel-chair. Left leg somewhat œdematous from knee downwards. Left knee, 14½; right, 13½; left calf, 13¾; right, 11½; heel and instep, left 12½, right 12¼.

April 24th.—Wound all but healed. I find for the first time since the last operation that there is a distinct thrill in a branch of the internal saphenous vein which lies over the calf. It is tortuous and plainly visible. The thrill extends quite up to the groin, but not over the site of the last operation, He has been up a little lately, and has complained of swelling of the leg, for which he has had to wear a Martin's india-rubber bandage.

May 8th.—He has for some time had pressure applied by means of a pad and bandage to the seat of communication between the vein and artery, but although this diminished the thrill it increased the œdema of the limb, so I decided to apply another ligature to the lower part of the superficial femoral artery as it was evident that the lower catgut ligature applied in the first operation had given way.

Chloroform and ether having been administered, a vertical incision between three and four inches long was made, with its upper extremity about half an inch above the bullet wound. On drawing aside the sartorius I found the artery, but it was roughened and adherent; so I could not pass the aneurysm needle round it at the point where I had before tied it with catgut. No trace of this catgut ligature was seen by me either in this or the second (the previous) operation. I therefore extended my incision downwards for about an inch, and tied the artery in Hunter's canal. It was about a quarter of an inch in diameter. A strong carbolised silk ligature was used, and I cut the ends short off. The thrill in

the varicose veins on the inner side of the calf at once ceased. There was a strong pulsation in the artery *below* the ligature, and a slight pulsation above it, but I could not feel the slightest thrill anywhere. As I thought that the cause of the pulsation above the ligature must be some branch coming off from that part of the artery I looked for it, but without any success.

No constitutional disturbance followed this operation. At first there was only serous discharge, and the greater part of the wound healed by primary union. On June 1st about two drachms of thick pus escaped through an opening which had formed one inch internal to the middle of the wound, and with the pus the silk ligature came away.

On June 20th the wound was healed, and he was able to get up on a wheel-chair.

26th.—Allowed to walk about; feels no pain, but a slight bruit can be heard with the stethoscope over the position of the wound.

On the 30th he went away without telling anyone of his intention. It was thought that he had been frightened by hearing some discussion near his bed upon the possible necessity of another operation to ligature the small artery which probably came off near the arterio-venous communication, and so kept up the faint thrill still perceptible in the immediate neighbourhood of the aperture. Nothing has been heard of him since.

Remarks.—There are many interesting questions which occur to one in connection with the case which I have here reported. The points, however, to which I propose to call attention are: (1) The condition of the blood-vessels in arterio-venous aneurysms; (2) the reason for this condition; and (3) the treatment which was adopted.

With respect to the first of these points, all the authors who treat of the subject describe the great enlargement of the veins, their varicosity, and the thickening of their walls. They also mention the great dilatation and thinning of the artery above the aperture of communication with the vein. But there is some difference of opinion with respect to the condition of the artery below the aperture. Some authors

assert that this part of the artery is contracted, and others that it is dilated and thinned. The former view is held by Erichsen,[1] who says, "The artery above the wound is dilated; below it is usually contracted," and he accounts for this by less blood "being conveyed by the lower portion of the artery." Holmes[2] states only that the arteries "become enlarged, tortuous, and thinned in structure" above the varix, thus seeming to imply that there is no change below. According to Pirrie[3] "the artery, on the distal side of the disease, becomes generally smaller, and its coats thinner, in consequence, no doubt, of the diminished quantity of blood received into it." Agnew[4] says, "The artery having much of its blood turned into the new channel, becomes contracted below, so that its pulsation is much diminished in strength, and is often quite indistinct on the distal side of the tumour." William Hunter[5] expresses himself more cautiously to the same effect. "The artery, I apprehend, will become larger in the arm, and smaller at the wrist than it was in the natural state." The only dissection of which I can find a record confirming this view is reported by Cock.[6] In this instance, however, there were many peculiar circumstances, such as the plugging of the vein above the aneurysmal sac of communication, and the formation of a large pouch on the vein at a lower point which make the case different from an ordinary arterio-venous aneurysm. Moreover, the femoral had been ligatured eleven years previously, twelve days after the wound of the popliteal artery and vein.

In my own case, so far as my incisions at the time of the operations disclosed the condition of the artery below the aperture of communication, it was decidedly larger and thinner-walled than normal. It is true that the pulse in the foot was weak, but I do not think that it necessarily follows that the arteries in this region were smaller.

Breschet, who describes several dissections of these cases, distinctly states that there is a varicose dilatation of the whole

[1] 'Science and Art of Surgery,' vol. i, p. 449.

[2] 'System of Surgery,' vol. iii, p. 91.

[3] 'Principles and Practice of Surgery,' p. 553.

[4] 'Science and Practice of Surgery,' vol. i, p. 575.

[5] 'Medical Observations and Inquiries,' vol. ii, p. 392.

[6] 'Medico-Chirurgical Transactions,' 1851, vol. xxxiv, p. 327.

of the artery below the wound.[1] "L'artère se dilate, ses parois s'amincissent, perdent leur résistance, acquièrent une mollesse comparable à celle des tuniques veineuses, elle devient flexueuse, revêt, peu à peu, les caractères d'une veine et d'une veine dilatée, et perd insensiblement tous ceux des tubes artériels, mais *seulement au dessous de la blessure.*"[2]

In South's Chelius[3] it is stated that "below the swelling the pulsation is weaker, but after long continuance the diameter of the artery also is increased, and the artery often becomes tortuous." In Heath's 'Dictionary of Surgery'[4] Gould states that in aneurysmal varix "the artery above and below the aperature is considerably dilated and its walls are thin." He adds, however, that "in some cases these changes have been most marked above the communication, and the vessel below has been described as contracted." The general conclusion which I have formed from the comparison of these passages and from the case under consideration, is that, at any rate for a considerable distance below the aperture, the artery is usually thinned and dilated. Of the condition of the more distal portions of the artery I am uncertain, but it seems to me by no means improbable that the feebleness of the pulsation in this part of its course has led observers into an erroneous impression that the calibre of the vessel is here diminished.

2. *The causes of the changes* in the vessels are nowhere clearly given. Dr. Wm. Hunter,[5] who was the first to accurately describe arterio-venous aneurysms, explains the enlargement of the artery thus: "That it is somehow the consequence of the blood passing so readily from the artery into the vein, and that it will always so happen in such cases; that it is not owing to any particular weakness in the coats of the artery, like that in a *true* aneurysm, naturally and constantly tending to rupture, but is rather such an extension, as happens to all arteries, in growing bodies, and to the arteries of particular parts, when the parts themselves increase in their bulk and

[1] 'Mémoires chirurgicaux sur différentes espèces d'anévrysmes,' p. 103.

[2] The italics are mine.

[3] Vol. ii, p. 268.

[4] Vol. i, p. 98.

[5] 'Medical Observations and Inquiries,' vol. ii, p. 408.

at the same time retain a vascular structure. It is well known that the arteries of the *uterus* grow much larger in the time of uterogestation." The meaning of this passage is not very clear to me. He cannot refer to any actual growth of the part which necessitates a large supply of blood, for the only structure which grows is that of the veins, which become thickened, dilated, and in many cases tortuous, and he could hardly speak of this increase of vein structure as comparable to the enlargement of the uterus in pregnancy. I suppose he must mean that the leakage from the artery necessitates a larger flow of blood, just as if it had to supply a larger limb, and that in consequence the vessel becomes dilated. He does not, however, explain why the walls become thinned.

Breschet[1] attributes the dilatation of the artery below the communication to the fact that after the systole the blood of the vein passes into the artery and makes it take on the character of a vein, while at the same time it produces a sort of "*asphyxia*" of the parts supplied by the vessel.

In my opinion the changes in the arterial walls are due to two causes :

The *first* is the waste of blood intended for the nutrition of the limb, owing to the aperture in the wall of the vessel. A great part of this blood enters the vein and goes back to the heart without reaching the limb at all. It is obvious, therefore, that the supply of blood must be increased either by enlargement of the vessel, or by an addition to the frequency of the pulse. As the latter alteration would necessitate an increased supply of blood to the other parts of the body, and would probably cause much embarrassment, it follows that the former expedient is adopted, and that the artery becomes dilated. To use a homely comparison, if you have to water a garden with a leaky watering-pot, you must have a pot of

[1] Op. cit., p. 148. He describes the process thus :—"Cependant, à la sistole de l'artère succède la diastole ; la veine qui est accolée à ce vaisseau se trouve comprimée, du sang reflue par l'ouverture de la veine et pénètre dans celle de l'artère, qui, par sa dilatation, permet l'entrée d'un peu de sang noir dans son canal. C'est ce sang qui la dilate et qui peu à peu la métamorphose en véritable veine. Plus cette dilatation augmente, plus il entre de sang veineux, et dès lors les influences de ce liquide dépourvu de principe excitant, se font de plus en plus sentir."

large size, or you must make more frequent journeys to the pump. The former plan is the only one admissible in the case under consideration.

The *second* cause is the increased resistance to the arterial stream, which is brought about as follows :—The blood from the artery entering the veins will retard the whole of the upward current in the lower veins of the limb. This retardation will be communicated to the stream in the capillaries, and thence to the current of blood in the arteries. The result of this backing up will be to increase the difficulty experienced by the arterial blood in forcing its way down the limb.

The thinning of the arterial walls is due, firstly, to the dilatation of the canal, and secondly, to the lessening of the pressure in the artery, caused by the escape of part of its contents into the vein. On account of this free communication there will be a tendency to the equalisation of the pressure within the artery and the vein; and we should therefore expect that the walls of the latter would hypertrophy, while those of the former would decrease in thickness.

At first sight it would appear that this weakening of the coats is hardly consistent with the second reason which I have given for the dilatation of the artery, viz. the increased resistance to the entrance of arterial blood into the canal; and no doubt there is a great difficulty in supplying a proper amount of blood to the structures of the limb, when the amount is curtailed by the leakage, at the same time that the hydraulic pressure is diminished. The only means to overcome this difficulty is the enormous enlargement of the conduits of supply, both above and below the aperture of communication. That this is at best but imperfect is shown by the weakness of the limb, together with its coldness, œdema, and lividity. I do not think that Breschet's theory is at all tenable, viz. that the dilatation and thinning, the approximation of the arterial walls, so to speak, to a venous character, are due to their containing venous blood. I doubt whether any considerable quantity of venous blood usually enters the artery. He publishes, it is true, an observation[1] which he made in a case of arterio-venous aneurysm to the

[1] Op. cit., p. 115.

effect that he could actually see the venous blood entering the artery during diastole, but this was after he had tied the artery above its opening into the aneurysmal sac, a proceeding which must have very considerably diminished the pressure of the blood in the artery. If there had been any such escape of venous blood into the artery in my case, we ought to have had some sign of it in auscultation. There would have been some appreciable pause in the bruit heard over the aperture of communication, indicating the changed condition of the current, whereas the bruit was of a continuous character, increasing in intensity during the systole, and then gradually diminishing, but never disappearing before the next beat.[1]

3. *The treatment adopted* in these cases depends to a considerable degree upon the region of the body in which the arterio-venous communication has formed. In the case of the vessels of the head and neck it would appear that the malady may exist for many years without causing any serious inconvenience to the patient.[2] In the upper extremity also where, from accidents in bleeding, this condition was formerly not infrequent, it seems in many instance to have been accompanied by little inconvenience, and patients thus affected have been able to go about their work without much difficulty. In the lower extremity, however, the normal circulation is always carried on under some disadvantage, as is shown by the tendency to varicosity in the veins, and by the spontaneous formation of ulcers from stagnation of the blood and deficient nutrition. We should therefore expect that the introduction of such a disturbing element as a communication which allowed

[1] I have been curious to ascertain whether the same result takes place in the communications which exist between arteries and veins in cases which come more frequently under the notice of physicians. There are numerous instances recorded* of such communications being found between aneurysms of the aorta and either the pulmonary artery or the vena cava superior, but I have been unable to find out whether the wall of the aorta in these cases becomes dilated and thinned, while that of the venous channel becomes dilated and thickened. There is frequent mention of irregular pouching of the aorta, but this may be the result of the disease which gave rise to the aneurysm.

[2] Breschet, cf. op. cit., p. 133.

* Cf. "Cases of Aortic Aneurysm opening into the Pulmonary Artery," by Frederick Taylor, M.D., 'Guy's Hospital Reports,' vol. xlii.

the arterial pressure to increase the difficulty already experienced by the veins in overcoming the force of gravity, would be productive of much more serious results. Many instances are on record which show that the changes set up in the vessels of the lower extremities are apt to be progressive, sometimes even many years after the original injury.[1] In my patient the condition of the limb had been for a long time such as to interfere considerably with his comfort, and to impede him in his work as a sailor, and latterly the pulsation in the abdomen had increased so much as to be a source of constant annoyance to him. There was also reason to suspect that the heart itself was embarrassed, possibly by the dilatation having extended to the ascending aorta, or by the enlargement of the inferior vena cava.

Milder methods of treatment had been already tried. The femoral artery had been for some time compressed by tourniquets, and also by the application of Esmarch's bandage. He had also worn a carefully fitted elastic stocking. Notwithstanding, his condition was gradually becoming worse, and the difficulty of following his regular employment was steadily increasing; there was also some fear that serious cardiac mischief might ensue if his symptoms were left unrelieved. There seemed therefore to those of my colleagues, whom I consulted, and to myself, no course open but that of operative interference.

Ligature of the artery above the lesion has been in numerous instances proved to be useless. The only operations admissible were that of ligaturing the artery above and below the aperture of communication, and ligature of the artery and vein at the same points. I chose the former measure as I thought it would be the simpler and less dangerous operation. It is true that Holmes,[2] in his valuable lectures before the College of Surgeons, speaking of arterio-venous aneurysms of the lower extremity, says that "all cases which have been dissected at a later stage of the disease prove that the artery

[1] See cases referred to in 'Med.-Chir. Trans.,' vol. lxxi, p. 215, Walsham on "A Case of Wound of the Femoral Artery and Vein." This paper also contains much valuable information upon the treatment of recent arterio-venous aneurysms of the thigh together with tables of cases.

[2] 'Lancet,' vol. ii, 1874, p. 509.

becomes so attenuated and enlarged above the tumour that no operative interference can then be successful. Hence the necessity for treating the disease decisively at first, and for abandoning operative interference if the case is not seen sufficiently early." I quite agree with him as to the desirability of early operation, but, in view of the greater safety which now attends the ligature of arteries by aseptic methods, I thought that there was a reasonable hope of success, even though I expected to find the artery in the thinned and dilated condition which he describes. The result of my operation abundantly proves the correctness of my surmise. Unfortunately I used for my ligature some of the ordinary unhardened carbolised catgut, which at that time we were in the habit of employing in most of our operations. There was no difficulty in applying the ligature although the artery was swollen to five eighths of an inch in diameter, and so thinned that it looked like small intestine. The symptoms were at once relieved, and primary union followed. All would have gone on well, and the patient would probably have been speedily cured, had not the ligatures one after the other been gradually absorbed, and at last yielded so as to allow the artery, at first above, then below, the communication, to resume its old calibre. If the ligatures had been of silk or some less soluble material than ordinary unhardened catgut, there is every reason to believe that the cure would have been permanent, for I do not think that the slight vibration to be felt between the two ligatures would have caused any trouble. It was probably due to some small artery coming off at this point and to the opposition of the stream of blood in it to that within the vein, which here communicated with the main artery.

When the operation had to be repeated, and, on account of the difficulty of isolating the artery a second time, I wounded the vein, I was compelled to resort to the more severe operation which has been successfully performed by Spence, Annandale, Walsham, and others in more recent arterio-venous aneurysms, viz. the simultaneous ligature of the artery and the vein. This operation was made more dangerous by the hæmorrhage and the necessity of more extensive manipulation than on the previous occasions. For a time the patient was in con-

siderable peril from the entrance of septic elements into the wound, and the consequent suppuration. It is interesting to observe, however, that even under these circumstances there was never any serious impairment of the circulation, and that the silk ligatures came away from the thinned and dilated artery without any secondary hæmorrhage.

The third operation, viz. that of tying the lower part of the artery when the ligature upon it gave way, was performed without any difficulty, and the patient recovered from it with a very slight amount of suppuration. I did not venture to tie the vein in this operation, because a little œdema had followed the ligature which I had applied to the higher part of the vein, and I was afraid to increase the interference with the blood circulation. As I have stated in my report, the patient disappeared from observation before he had completely recovered the use of the limb. When last seen the only trouble he complained of was slight œdema of the limb after walking, and I think it probable that, as the collateral veins enlarged, and the vessels generally became accustomed to the strain thrown upon them by the resumption of the upright position, this condition gradually disappeared.

EXPERIMENTS

ON THE

INFLUENCE OF CREOLIN ON THE ANTHRAX BACILLUS.

By J. W. WASHBOURN, M.D.

Creolin is a substance prepared by the distillation of English pit-coal, and is a dark brown syrupy liquid of a tar-like odour, forming a milky emulsion when mixed with water. It was first recommended by Professor Attfield as a good antiseptic and disinfectant. His experiments were, however, not made with pure cultivations of bacilli, but in connection with disinfection in a general sense.

Dr. E. v. Esmarch, of Berlin ('Centralblatt für Bacteriologie und Parasitenkunde,' Jena, 1887, ii Band., Nos. 10 and 11), was the first to study the action of creolin on pure cultures of bacilli, the object of his experiments being to compare the relative value of creolin and carbolic acid as disinfectants. The method he adopted was that described in the 'Zeitschrift für Hygiene,' i, 2, and is of such value and convenience that it is worth quoting here in full. Before, however, doing this it will be well to recall some important considerations which must be remembered in the investigation of any antiseptic. These points were first clearly indicated, and strongly insisted upon, by Koch. Firstly, we must make separate experiments with

bacilli containing spores and bacilli free from spores. When spores are present the antiseptic requires to be much stronger, or must act on the bacilli for a much longer time in order to produce a destroying influence.

Secondly, one must distinguish between the actual killing of the bacilli and the prevention of their growth. To prove the latter point it is only necessary to take a *suitable* cultivation medium, add a known quantity of the antiseptic, and then vaccinate with the bacillus under investigation. If the bacillus refuses to grow, the medium having been previously proved to be a suitable one, this failure to grow can only be due to the presence of the antiseptic. That the bacilli are actually killed, however, by no means follows, for they may still grow when transplanted to a suitable soil.

The following method, modified from Koch's by v. Esmarch, was adopted by him in his investigations on the action of creolin in killing bacilli.

A flask containing sterilised bouillon is vaccinated from a pure culture of the bacillus under investigation. It is then put in the warm chamber until a good growth of the bacilli has occurred. This can generally be determined by the amount of turbidity of the bouillon, or if necessary by microscopical examination. About 10 cc. of the bouillon is now taken out of the flask and put into a sterilised tube, and a measured quantity of the antiseptic added, and the mixture well shaken. The strength of the antiseptic in this mixture can of course be readily calculated. After a measured time a drop of the mixture is taken out, by means of a small platinum loop, and is transferred to a tube containing gelatine cultivation medium liquefied at a temperature of 35° C. The mouth of the tube is now plugged with cotton wool, and the gelatine is spread in a thin layer over the inner surface of the tube by carefully rolling the latter between the fingers and thumb. As soon as the gelatine has become solid the tube is put in a chamber at about 20° C. In a few days it is very easy to see whether the tubes remain sterile or whether colonies develop. In the latter case the colonies, the number of which can be easily counted, must be examined microscopically and by further cultures, to show that they are those of the bacilli under investigation and not accidental impurities. To prevent

the presence of the latter all the operations must be performed with the most careful precautions. It is necessary to use the same platinum loop in order that the size of the drop may always be the same, and in every case control experiments must be made. The only objection to this method is that the minute quantity of antiseptic, brought into the gelatine by the platinum loop, may be sufficient to make this medium unsuitable for the growth of the bacilli. To eliminate this error it is necessary, after a period of some weeks, to revaccinate the tubes, which remain sterile, from a pure cultivation of the bacillus under investigation. If the latter grow then it shows that the small quantity of antiseptic present is not sufficient to make the medium unsuitable for their growth.

The bacteria investigated by v. Esmarch were the Staphylococcus pyogenes aureus, and the bacilli of Asiatic cholera and typhoid fever. In each case he found creolin superior as an antiseptic to carbolic acid.

Dr. James Eisenberg ('Wiener medizinische Wochenschrift,' Wien, 1888, No. 17) much extended the researches of v. Esmarch. His experiments, which were conducted in the most careful manner, were made on the action of creolin upon the following bacteria—arranged in the order of their resisting power: Staphylococcus pyogenes aureus, Micrococcus tetragenus, Staphylococcus pyogenes albus, Bacillus pyocyaneus, Staphylococcus cereus flavus; typhoid bacillus, Bacillus pyogenes fœtidus; anthrax bacillus, cholera asiatica, Streptococcus erysipelatis, Streptococcus pyogenes.

The difference in their resisting power was great, *e. g.* creolin in 2 per cent. watery solution acting during one minute was found to kill Streptococcus pyogenes, while for Staphylococcus pyogenes aureus 3 per cent. was required when acting for the same time.

I will quote in full the results with regard to the anthrax bacillus:

2 p. c. creolin acting for 5 min. killed anthrax bacilli.
½ p. c. „ „ 1 min. „ „
1 p. c. „ „ ½ min. „ „
3 p. c. „ „ 10 sec. „ „

Other experiments were made with regard to the action of

creolin in preventing the development of the anthrax bacillus. He found that the bacilli refused to grow in gelatine cultivation medium when the creolin was present in the proportion of 1 in 15,400.

This result appeared so remarkable that I considered it advisable to repeat the experiment.

The method adopted was as follows :[1] A measured quantity of creolin, 5 per cent., was added to 10 cc. of gelatine cultivation medium, which had been liquefied by warming. A good mixture was produced by careful shaking, and the gelatine allowed to solidify. Vaccination from pure cultures of anthrax bacilli were then made in the usual way with a platinum wire. Control experiments were always performed.

I. 1 *Exp.*—Creolin 1 in 2800. No growth, but gelatine became slightly fluid some days after vaccination.

II. 2 *Exp.*—Creolin 1 in 9600. No growth, gelatine remains firm.

III. 3 *Exp.*—Creolin 1 in 19,100. No growth, but gelatine became slightly fluid some days after vaccination.

IV. 1 *Exp.*—Creolin 1 in 19,100. No growth, gelatine remains firm.

V. 2 *Exp.*—Creolin 1 in 40,200. Growth, but not good.

Remarks.—In the cases where the gelatine became slightly fluid this was probably due to the action of a ferment in the dead bodies of the bacilli. That it was not due to a growth of the bacilli was shown by microscopical examination made some weeks afterwards, and which only showed the presence of a few degenerated bacilli. Revaccinations were also made, but always with a negative result.

The result of these experiments shows that while creolin, in the proportion of 1 in 40,200, has a deterring influence on the growth of anthrax bacilli, in the proportion of 1 in 19,100 it prevents their growth altogether.

With regard to spores, both v. Esmarch and Eisenberg made experiments in a similar manner, but obtained very different results. The method employed was that of Koch, and is performed in the following way : From a pure culture of anthrax bacilli, which has been proved microscopically to

[1] The creolin was kindly sent me by the manufacturers, Messrs. Wm. Pearson and Co., Hamburg.

contain spores, an emulsion with distilled sterilised water is made. Pieces of sterilised silk thread are now laid in the emulsion until they are thoroughly impregnated; they are then dried in a sterilised tube, and kept until required for use. It is now only necessary to take out a thread, lay it in the antiseptic for a measured time, and wash in distilled sterilised water. It is then put into a tube containing a gelatine cultivation medium, which can be spread over the inner surface of the tube according to the method already described. If the tube after a proper incubation period remains sterile, the spores have been killed by the antiseptic. Control experiments must be made with threads treated in exactly the same way, except that distilled sterilised water is substituted for the antiseptic.

E. v. Esmarch found that carbolic acid was superior to creolin in its action upon spores. The latter in 5 per cent. solution, even when acting for twenty days, failed to kill anthrax spores, while the former produced that effect in the same time, though it failed to do so when only acting for sixteen days. It must be mentioned that Koch found that carbolic acid in 5 per cent. solution killed anthrax spores when acting for two days.

Eisenberg, on the other hand, showed that carbolic acid was much inferior to creolin in its action on anthrax spores. The results of his experiments were as follows:

Creolin 2 p. c. kills anthrax spores in 4×24 hours
„ 3 p. c. „ „ 2×24 „
„ 4 p. c. „ „ 2×24 „
„ 5 p. c. „ „ 2×24 „
„ 6 p. c. „ „ 24 „

Carbolic acid, however, in 8 per cent. solution, even when acting for 7×24 hours, failed to kill the spores.

On account of these discrepancies I thought it advisable to repeat these experiments. The method adopted was similar to that above described, but the threads, instead of being laid in gelatine, were put into tubes containing bouillon, and then transferred to the warm chamber. After about twenty-four hours any development of anthrax bacilli could easily be recognised by a peculiar thready precipitate. If such a precipitate formed, it was in every case microscopically proved

to be anthrax. Where no precipitate occurred, the contents of the tube were always microscopically examined after five or six weeks to prove the absence of bacilli. The threads used, although five or six years old, proved to be very virulent. Control experiments were always made, and each experiment was repeated three times.

I.

	p.c.		1*st Exp.*	2*nd Exp.*	3*rd Exp.*
Creolin	5	Acting 5 mins.	No growth.	No growth.	No growth.
Corrosive sublimate	1	„	„	„	„
Carbolic acid.....	5	„	Good growth.	Good growth.	Good growth.
Control			„	„	„

II.

	p.c.		1*st Exp.*	2*nd Exp.*	3*rd Exp.*
Creolin	5	Acting 5 mins.	No growth.	No growth.	No growth.
Corrosive sublimate	1	„	„	„	„
Carbolic acid.....	5	„	Good growth.	Good growth.	Good growth.
Control			„	„	„

III.

	p.c.		1*st Exp.*	2*nd Exp.*	3*rd Exp.*
Creolin	5	Acting 5 min.	No growth.	No growth.	No growth.
Corrosive sublimate	1	„	„	„	„
Carbolic acid.....	5	„	„	Good growth.	Good growth.
Control			Good growth.	„	„

According to these experiments, creolin in 5 per cent. solution killed anthrax spores when acting for five minutes. Corrosive sublimate in 1 per cent. solution produced the same effect, while carbolic acid in 5 per cent. solution only did this in the 1st Experiment, Series III, that is once out of nine times. These results were quite at variance with both those of v. Esmarch and Eisenberg, and can only be explained on the assumption that spores possess a variable resisting power to antiseptics, due to age and other conditions, for it must be remembered that my spores were five or six years old.

From the above facts it will be seen that creolin is a good antiseptic, certainly superior to carbolic acid in its action on sporeless bacteria, and probably superior also when acting on spores.

Now, one of the properties of the principal antiseptics such as corrosive sublimate and carbolic acid, is their extremely poisonous nature; creolin, however, has been claimed to be absolutely non-poisonous by Dr. Fröhner and others. The claims are based on the following experiments:

Dr. med. Fröhner ('Archiv für wissentschaftliche und practische Thierheilkunde,' Berlin, 1887) fed dogs and horses upon creolin in doses of two to fifty grammes without any injurious effect.

Dr. F. Spaeth ('Münchener medizinischer Wochenschrift,' München, 1888, No. 15) found he could take as much as eight grammes of creolin daily by the mouth without any injurious effect.

Since this time creolin has been frequently used as a medicine in doses of half to one gramme.

On the other hand, Dr. J. Neudörfer ('Internat. klinische Rundschau,' Wien, 1888, Nos. 17 and 18) found that the injection of *pure* creolin into the venous system of a dog in doses of one gramme, repeated three times at intervals of five to fifteen minutes, produced death, which was preceded by salivation and *convulsive movements*. Post mortem, the heart, liver, and kidneys were found to be filled with blood, while the spleen was quite bloodless.

A strong objection can be made to this experiment, namely, that death was due to the mechanical action of the creolin. One can hardly expect to be able to inject a syrupy liquid like creolin directly into the blood with impunity.

Now, Dr. Behring ('Deutsch. mediz. Wochenschrift,' 37, 1887) attempted to kill anthrax bacilli in the living body of various animals by the injection of argentic oxide solution. He first proved that the oxide dissolved in penthamethylendiamin was a strong antiseptic readily killing anthrax bacilli, and thought it would be possible, by the injection of this fluid, to actually kill the bacilli in the blood of an animal suffering from anthrax. He first vaccinated animals with anthrax, and then injected the solution, and decided, at the post-mortem, by the presence or absence of bacilli, whether the animal died from anthrax or from silver poisoning. The results of his experiments were as follows:

1. With doses, not fatal, rabbits lived one to three days,

guinea-pigs two to three days, mice twelve to twenty-four hours longer than the control animals.

2. When the animals died from silver poisoning no bacilli were found either in the blood or the organs, even if the animals lived longer than the control animals.

3. One rabbit and one guinea-pig lived after having been vaccinated with anthrax and then treated with silver solution.

4. When the dose of silver solution was small, the animals died, if anything, sooner than when no silver solution was injected.

Considering the poisonous nature of silver oxide, these results were so far favorable as to induce me to make a similar attempt with creolin, a substance which appeared to be practically non-poisonous and certainly a strong antiseptic.

These experiments were made in Germany.

The first experiments I made were upon ordinary house mice.

First experiment.

June 16th.—1 p.m., 1 cc., 1 per cent. creolin injected into the subcutaneous tissue of the back of a mouse.

17th.—Quite well.

18th.—Still well. 4 p.m., again injected 1 cc., 1 per cent. creolin. 5 p.m., vaccinated at root of tail with anthrax. At the same time vaccinated control mouse.

19th.—Both animals well.

20th.—Both died in the night. *Post-mortem.*—Many anthrax bacilli found in spleen juice of both mice. Cultures laid on gelatine from the heart blood developed characteristic anthrax colonies. Under the skin of back a large pouch was found containing unabsorbed creolin.

Second experiment.

June 18th.—11 a.m., 1 cc., 5 per cent. creolin injected under skin of back of field mouse. The animal was seized, a few minutes afterwards, with convulsive movements, but very soon recovered.

19th.—Quite well. 12 a.m., 1 cc., 5 per cent. creolin again injected. 1 p.m., vaccinated with anthrax.

20th and 21st.—Well.

22nd.—Died in the night. *Post-mortem.*—Many anthrax bacilli found in spleen juice. The spot of injection in a similar condition to that in first experiment.

Third experiment.

July 6th.—11 a.m., 1 cc., 5 per cent. creolin injected under skin of back of house-mouse. 5 p.m., vaccinated with anthrax.

7th.—Somnolent and ill.

8th.—Died in the afternoon. *Post-mortem.*—Spleen juice full of anthrax bacilli. Condition of injection spot same as before.

Remarks.—In these three experiments the creolin was injected only before the vaccination. It evidently had no effect on the disease, as the animals all died from anthrax.

Fourth experiment.

July 3rd.—11 a.m., ½ cc., 5 per cent. creolin injected under the skin of back of mouse. 12 a.m., vaccinated with anthrax. 1 p.m., ½ cc., 5 per cent. creolin injected. 3 p.m., animal somnolent; ½ cc., 5 per cent. creolin injected. 4 p.m., ½ cc., 5 per cent. creolin injected. Immediately after this injection the animal became very ill, and was unable to move the left leg. 5.30 p.m., ½ cc., 5 per cent. creolin again injected. After this injection the animal became quite helpless, and died at 6 p.m. *Post-mortem.*—No bacilli were found in spleen juice. Vaccinations made on gelatine from heart blood did not grow. Condition of injection spot same as before.

The control animal died on the night of July 4th.

Fifth experiment.

July 4th.—11 a.m., ¼ cc., 5 per cent. creolin injected under skin of back of mouse. 12 p.m., vaccinated with anthrax. 1 p.m., ¼ cc., 5 per cent. creolin injected. 3 p.m., ¼ cc., 5 per cent. creolin injected. 4 p.m., ¼ cc., 5 per cent. creolin injected. Animal somnolent.

5th.—Died in the night. *Post-mortem.*—No bacilli found in

spleen juice. Vaccinations made on gelatine from heart blood did not grow. Injection spot same as before.

Sixth experiment.

July 9th.—3.30 p.m. Mouse vaccinated with anthrax. Immediately afterwards 1 cc., 5 per cent. creolin injected. 8.30 p.m., appears ill and somnolent. 1 cc., 5 per cent. creolin again injected.

10th.—10.30 a.m., still ill and somnolent. 1 cc., 5 per cent. creolin again injected. 3 p.m., died. *Post-mortem.*—No bacilli were found in the spleen juice. Vaccinations on gelatine from heart blood did not grow. Injection spot as before.

Remarks.—In the fourth and fifth experiments the creolin was injected both before and after the vaccination, while in the sixth experiment it was only injected afterwards. In each case the animal died, but not from anthrax, as was shown by the absence of bacilli in spleen and blood. The cause of death was either due to the mechanical injury caused by the injection, or to the toxic action of the creolin. The following experiments were made to decide this point.

First experiment.

July 9th.—3.30 p.m., 1 cc., 10 per cent. creolin injected under skin of back of mouse. 8.30 p.m., ill and somnolent.

10th.—Still somnolent, and in the afternoon evidently dying.

11th.—Died in the night. *Post-mortem.*—A pouch found under the skin of back filled with unabsorbed creolin. Scrapings from the kidney and liver examined fresh in salt solution appeared quite normal. Sections from the kidney and liver hardened in alcohol and coloured with picrocarmine appeared normal.

Second experiment.

July 12th.—12.45 p.m., 1 cc., 10 per cent. creolin injected under the skin of back of mouse. Immediately afterwards the animal was seized with convulsive movements, which, however, passed off in about a quarter of an hour, leaving the animal somnolent. 4 p.m., still somnolent.

13th.—Died in the night. *Post-mortem.*—No microscopical

changes were found in the liver or kidneys. Injection spot as before.

Third experiment.

July 13th.—1 cc., 5 per cent. creolin injected under the skin of back of mouse. After the injection the animal appeared quite well.

14th.—Animal somnolent and dying.

15th.—Died in the night. *Post-mortem.*—No microscopical changes found in liver or kidneys. Injection spot as before.

Fourth experiment.

July 14th.—11 a.m., 1 cc., 5 per cent. creolin injected under skin of back of mouse. Immediately afterwards the animal was seized with convulsive movements which lasted an hour and left animal somnolent. Death took place in the evening. *Post-mortem.*—No microscopical changes found in liver or kidneys. Injection spot as before.

Fifth experiment.

July 14th.—11.15 a.m., 1 cc., 5 per cent. creolin injected under skin of back of mouse. A few minutes afterwards the animal was seized with convulsive movements which lasted about half an hour, and left animal a little somnolent. 3 p.m., animal quite well and lively.

15th.—Died in the night. *Post-mortem.*—No microscopical changes found in liver or kidneys. Injection spot as before.

From these and the preceding experiments, I came to the conclusion that creolin, when subcutaneously injected, is a poison to mice. The mechanical injury certainly was somewhat severe, and no doubt was a factor in producing death, but the convulsive movements pointed strongly to a toxic influence. It will be remembered that convulsive movements occurred in Neudörfer's experiment when pure creolin was injected into the venous system. The symptoms of poisoning by creolin are somnolence, generally preceded by convulsions; in some cases there is a period in which the animal apparently quite recovers, but nevertheless dies. Post mortem, no changes in the epithelium of the kidneys or liver are found. The

lameness observed in Experiment 4 (Series I) seemed to be due to the mechanical injury caused by the injection.

I now considered it useless to continue experimenting on mice, and made the following experiments on guinea-pigs.

First experiment.

July 11th.—3.30 p.m., a guinea-pig vaccinated behind the ear with anthrax. Immediately afterwards 5 cc., 10 per cent. creolin injected under the skin of abdomen. 8.30 p.m., 5 cc., 10 per cent. creolin again injected.

12th.—Quite well. 12.30 p.m., 5 cc., 10 per cent. creolin again injected.

13th.—Quite well. 12 p.m., 5 cc., 10 per cent. creolin again injected.

14th.—Quite well. No injection made.

15th.—Quite well. 11 a.m., 5 cc., 10 per cent. creolin injected.

16th.—Quite lively but losing flesh. No injection made.

17th.—Died in the night. *Post-mortem.*—The spleen juice contained countless anthrax bacilli; vaccinations made on gelatine from heart blood developed into characteristic anthrax colonies. Under the skin of abdomen a large pouch was found containing unabsorbed creolin.

Second experiment.

July 16th.—12 p.m., a guinea-pig vaccinated behind the ear with anthrax from same culture as last. Immediately afterwards 5 cc., 10 per cent. creolin injected under the skin of abdomen. 5 p.m., 5 cc., 10 per cent. creolin again injected.

17th.—Quite well. 1 p.m., 1 cc. *pure* creolin injected.

18th.—Ill and somnolent. 1 p.m., 1 cc. *pure* creolin injected.

19th.—Died in the night. *Post-mortem.*—Countless anthrax bacilli found in the spleen. Under the skin of abdomen a pocket was found containing much unabsorbed creolin.

Third experiment. Control.

July 16th.—12 p.m., a guinea-pig vaccinated with anthrax from same culture as preceding.

17th and 18th.—Quite well.

19th.—Died in the night. *Post-mortem.*—Countless anthrax bacilli found in the spleen.

Remarks.—It will be seen that the animal in Experiment 1 lived five and a half days; in Experiment 2 and in control experiment only two and a half days. All the animals were vaccinated from the same culture. In Experiment 2 the injection of *pure* creolin had no influence either in prolonging life or in preventing the development of the bacilli. The amount of creolin found post mortem under the skin of abdomen showed that very little could have been absorbed. In Experiment 1 the injection of 10 per cent. creolin prolonged the life of the animal three days, but it nevertheless died from anthrax, as was shown by the number of bacilli found in the spleen after death. The day before death no injection was made.

Fourth experiment.

July 24th.—4.30 p.m., a guinea-pig vaccinated behind the ear with anthrax. Immediately afterwards 5 cc., 10 per cent. creolin injected under the skin of abdomen.

25th—29th.—Quite well, 5 cc., 10 per cent. creolin injected daily.

30th.—Ill and somnolent, 5 cc., 10 per cent. creolin injected.

31st.—Still ill, 5 cc., 10 per cent. creolin injected.

August 1st.—Animal died to-day. *Post-mortem.*—No bacilli were found in spleen, but a vaccination made from spleen juice on gelatine, after a long incubation period, developed into characteristic anthrax colonies. The skin of abdomen was separated from the underlying tissues by a large pouch containing unabsorbed creolin, as in the preceding experiments.

Fifth experiment. Control.

July 24th.—4 p.m., a guinea-pig vaccinated behind the ear from the same anthrax culture as preceding.

25th—27th.—Quite well.

28th.—Died in the night. *Post-mortem.*—Countless anthrax bacilli found in spleen.

Remarks.—The animal in Experiment 4 lived four and a

half days longer than the control animal, although both were vaccinated at the same time, and from the same culture. The cause of death was certainly not due to anthrax, for no bacilli were found on microscopical section in the spleen. That all the bacilli were not destroyed by the creolin was shown by the result of the cultures from the spleen juice. The disease, although kept under control, was not cured, for there must have been a few bacilli in the blood capable of development. Death was probably due rather to the mechanical injuries produced by the injections than to the toxic influence of the creolin, for no symptoms came on until the fifth day, and the mechanical injury was considerable. The action of the creolin on the bacilli must have been through the blood, for the spot of vaccination was far from the direct influence of the injected creolin.

Time now unfortunately compelled me to bring my experiments to an end. I considered them only worth recording as showing, firstly, that creolin is a poison to mice when subcutaneously injected, and secondly, that it is able to hinder and almost entirely prevent the development of anthrax bacilli in the blood of a living animal. Possibly if it were made more absorbable, and administered in appropriate doses, the development of the bacilli might be entirely and permanently prevented.

In conclusion, I have only to thank Brof. Baumgarten, of Koenigsberg, in whose laboratory and under whose supervision I made these experiments, for the kindness he showed and for the assistance he so readily gave me.

ON

INNOMINATE FEVER AND ANTIPYRETICS.

By JAMES F. GOODHART, M.D.

In the present paper I wish to maintain, and support in some measure by examples, that there is many a case of pyrexia which cannot as yet be classified. I think I see far too great a tendency still existing to label all continued fevers with some definite name, or rather, perhaps, to stretch a very limited number of types, so as to include all cases of continued fever that occur, whereas, in truth, it is probable that there is many a case that should remain, in the present state of our knowledge, unnamed—and if so the fact is not without its meaning and suggestions. Dr. Hale White has already developed a similar line of thought, and has published a paper[1] on "Inexplicable Fever." As may be seen in what I have now to say, I agree with him almost entirely that cases such as he has narrated, and some of those contained in the present paper, do tend to support the view so ably argued by him that a heat centre exists in the central nervous system which, becoming disturbed, gives rise to pyrexia of some duration, and which it is impossible to assign to any other more definite cause in no small number of cases.

Inasmuch as my object is chiefly clinical, I shall depend for the most part upon cases, and I need hardly apologise for so doing, since there are few other means so successful in awaking the responsive memories of the reader as this is.

[1] 'Brit. Med. Journ.,' 1886, vol. ii, p. 1096; 'Practitioner,' Jan., 1886.

The question whether a particular febrile attack is due to "perverted thermogenetic metabolism" or not is very interesting and important, in relation to the use of antipyretic remedies; but time is required to appreciate in its full intensity what is involved by such an assertion, whereas a case of like kind to one or many that we ourselves remember is spontaneously absorbed and helps us, at any rate as we think, to see our way more clearly, and in the end does make for the root of the matter, albeit not quite so directly. Now, to take the most common case first, all sorts of febrile conditions having only the common feature of continued fever, are swept into the net of typhoid.

Here is such a case that exercised us much in the Clinical Ward at Guy's a few months back (Chart 1).

A man, æt. 30, an attendant in the Suffolk County Asylum, was sent in by Mr. Hubert Sells for pyrexia. He had suffered with psoriasis for a long time, had been treated with arsenic and was well bronzed, as I think, in consequence. But about a fortnight before admission he was taken ill, became languid, and vomited. He had been attending a typhoid patient. His temperature had been up to 102° and 103°, but he did not take to his bed till four days before admission; he had no diarrhœa and no spots. He was admitted on the fourteenth day of his illness and ran a mild, continuous fever of three weeks' duration, but he had no other symptom whatsoever.

We are all familiar with the fact that typhoid fever varies much; one or other of its typical symptoms will often be wanting. We are well acquainted with the ambulant form, in which the evidence might appear to be in favour of a similar absence of all symptoms, except that hospital patients are notorious for denominating severe ailments "nothing." But I am not prepared to admit as proved that when a man is carefully watched in bed from day to day, and positively no symptoms of typhoid fever develop, that, nevertheless, the patient has the characteristic lesions of typhoid. He may perhaps have typhoid fever, but it must, I think, be typhoid modified in most of its typical features. And if typhoid be thus devoid of its symptoms and lesions is there the need of dieting such a patient so scrupulously as is the habit in typhoid? Personally

I am of opinion that in the matter of diet we are guided far too much by routine even in typical typhoid, and that more variety of easily assimilable food may often be given, without disadvantage, and sometimes to the great comfort of the patient, if it be given with discrimination. But in these anomalous cases more certainly so. And in this case the man was very hungry, and was truly thankful for such small mercies as bread-and-milk and custard, which were ordered for him early in the attack.

There are a large number of cases in practice that keep us on the tenter-hooks of doubt. Is it typhoid? Is it tubercle? we ask. Some turn out to be the one, some the other, and some we can never name.

Only a month or two ago I saw a girl of about eleven years old with Mr. Atkins, of Sutton, who was said by her parents to have been ill for three months. She had been feeling chilly, and liked to be near the fire, and therefore had not gone to school. Mr. Atkins had seen her for ten days, she had a temperature of about 104°, much sweating, and questionable disease at the right apex. I saw her about 2 p.m., when her temperature was over 103°. She was in bed, in a drowsy state, but constantly moaning, and very irritable and noisy when disturbed. Her tongue was dry, brown, and red. She was very pale. Her respirations were quick, but there was no dilatation of the alæ nasi. On auscultation one heard a mixture of bubble and squeak all over, but I was unable to localise any definite phthisis. The abdomen was a little tumid perhaps.

Neglecting the early history of three months' illness, which one is compelled often to ignore in what turns out to be true typhoid, and looking at the case all round, the picture seemed to me to be one of typhoid rather than tubercle. But I was hoist with my own petard. I was wrong. She died a few days later, and the lungs were found stuffed with tubercle. The sight of that lung was a very instructive one as regards drawing conclusions from a single examination. From the amount of disease one could hardly conceive it possible that a mistake could have been made. Yet I venture to say that from auscultation alone several examinations might be required to arrive at a correct opinion in any such case. I have seen

many other similar cases where *bronchitis* was the only proper diagnosis, and bronchitis may as well be typhoid as tubercular or anything else.

I will next give a Chart of a case which threatened tubercle and turned out not to be so. At least the patient is now quite well (Chart 2.)

The child was 6½ years old. I saw it on February 12th, and it had been ill since Christmas, worse the last three weeks,—"so cold," tired, anorexic, silent. The temperature, taken regularly for a fortnight, had been found to be regularly up above 101° every night, and down to normal in the morning.

Now these symptoms, together with some, I think doubtful, consumptive history on the mother's side, made the parents and doctor very anxious and apprehensive of tubercle; but there was absolutely no evidence to corroborate this suspicion; the pulse was 120, excessively feeble, the tongue thickly coated, the breath foul. The bowels were obstinately confined, and it had been noticed that she was always better after a good clearance.

I made this note of her:—"It is probably not tubercular (1) because of the foul tongue and offensive breath; (2) because of her clear-headedness,—she likes to read; (3) she sleeps well; (4) she takes her food badly. She looks to me to be one of the anæmic children one sometimes sees with erythema nodosum, who remain out of sorts for a long time, and yet one can never say what is definitely the matter. Perhaps for this case one might suggest the term fæcal fever."

She had a regulated diet, and sufficient castor-oil or Magnes. Sulph. and nux vomica to keep the bowels regularly open, and she is now quite well. But what was her fever?

Of other cases that raise the question of tubercle and never settle it there are no end.

(Chart 3). A little boy, æt. 2½, was admitted into Guy's in January of this year, with a history of symptoms that betokened meningitis. He had severe pain in the head, screamed out frequently, was unable to bear a strong light, and there had been some retraction of the head. He was in the hospital two months, and during all that time, except that he would now and again with some frequency have some bronchitic râles here

and there, his only malady was pyrexia. He left the hospital with his surface temperature still in a very unstable condition, as may be seen from the Chart, but he has been seen lately; his temperature is normal, and the child appears to be quite well.

In the next case the question of tubercle again haunted us, but this patient was also very *anæmic* (Chart 4.)

A nursemaid of 17 was admitted for headache Her father was alive but suffered from chonic bronchitis; her mother died in child-birth, which, by-the-bye, is generally, I believe, regarded by the medical officers of insurance companies as likely, in the absence of definite facts regarding the accidents of parturition, to be tubercular. She was very anæmic, and there was a decided deficiency of breath-sounds on the right side of the chest, with a little questionable dulness. She had no other symptom except pyrexia. At first I thought this might be part of the extreme anæmia, but it went on so long, and the patient seemed to be steadily going downhill, that I was on the point of discarding this hypothesis and betaking me to that of tubercle, when one day I saw the temperature had fallen, and from that day she began to mend and rapidly got well.

She had three-minim doses of Liq. Sod. Arseniatis from the beginning, and I think the anæmia was better therefrom, but no marked improvement took place until the temperature fell. What the pyrexia was due to it is hard to say, but severe anæmia is sometimes associated with pyrexia, and I think that when so it is very likely to end fatally.[1] Here is such a case (Chart 5.)

A young lady, æt. 21, under the care of Mr. Warner Lacey at Woolwich. The catamenia had appeared on one occasion a year or two before. Some twenty months before her death she was exceedingly ill with anæmia. Mr. Lacey feared she would die, but she pulled round, and since that time till August last year she had been quite well, having regained her colour and being able to walk up and down hills without breathlessness.

[1] I have to add concerning this case that not long after she again became pyrexic, and developed an acute general dermatitis and jaundice, from which she died, and the autopsy added nothing additional to our knowledge.

In August last she went to Dublin, and was ill there with what was called anæmic fever. She felt better, but never really picked up, and she again failed early in December of last year. As a matter of economy, medical advice was not sought until December 16th, when her temperature was 105·2°. The next two days it was much the same, and then it fell and maintained a level of 102° or 103°. She was restless, sick, and breathless.

I saw her eight days later, when she looked absolutely blanched and yellow, with puffy face and watery conjunctiva. The heart's action was much disturbed, cantering and rapid, 120—130, but no bruit, save a questionable pericardial rub. The respiration averaged 32 to 40. The urine was normal.

The aspect of the case was very ominous, but she was given half a grain of opium 6tis horis, and some iron and arsenic. The temperature fell at first to 99°, but rose again to 105°, and with it at this point she died. (See Chart 5.)

Perhaps of similar kind is the pyrexia sometimes seen in bad cases of purpura; here is such a case. (Chart 6.)

A girl æt. 14, a servant, said to have been always delicate, was admitted for extreme anæmia and purpura.

She had caught cold a month before, and afterwards complained of pains in the head and body. She had lost flesh and strength rapidly, and had been in bed for a fortnight.

She was excessively ill, blanched to a degree, with petechial spots all over her, sordes about her mouth, offensive breath, delirious, and with a temperature of 105·2°. She was treated with quinine in five-grain doses, with perchloride of iron and stimulants, and an attempt was made to control the temperature by ice sponging and ice poultices. She was too ill to try antipyretics other than these, and she gradually sank.

At the post-mortem early tuberculosis of both lungs was found, in addition to a bad broncho-pneumonia, which had, I think, originated in the unhealthy state of her mouth. The existence of tubercle is interesting, because it very possibly links the case on to those of varicella and vaccinia gangrenosa, which have been found to occur in most of the recorded cases (Payne and Barlow) in association with tubercle.

Space forbids my giving more than two other cases to illustrate one other group. (Chart 7.)

A boy, æt. 8, was admitted on January 3rd, 1887, into Clinical Ward for pains in the head and limbs and occasional contraction of the limbs after sitting for some time, together with fever and thirst.

There was no family history of any note. The patient had measles when two years of age, followed by intermittent fever. He has also had more than one attack of inflammation of the lungs. In 1883 he was in Guy's, suffering from chorea with fever, which came on after fright. He had well-marked chorea of a paralytic kind at that time, and a short and moderate pyrexia of 101°. He had inflammation of the lungs eighteen months ago, and was ill two months, but since then he had been well until two months ago. His present attack was of indefinite onset.

He was a thin, delicate, pale boy, with pains about him but no swelling. No organic disease was ever discovered. His temperature ran the remarkable course seen in the Chart, but it seemed to do him little harm or cause him any inconvenience, and after a six months' stay in the hospital he left in much the same condition as when he was admitted.

The other (Chart 8) has this, to my mind, instructive history attached. The patient is a young lady of fourteen years. Her father might, I think, be gouty to look at him. She is unquestionably neurotic; her face and manner and general behaviour all indicate this, and some years ago she had a series of convulsions, six or seven in a period of three years. She has had none now for a long time, but she has ever since been emotional and somewhat difficult to manage.

On February 14th she had a supposed chill—a catamenial period being present at the time. She had flying pains about her, chiefly in her joints, and her toes particularly, but no redness or swelling. She was not seen medically for some days, but at the end of a week her temperature was found to be raised, and for six weeks onwards she had continuous fever. She had been in bed all that time, but had never been really ill, and had in consequence rebelled much at her treatment. She is now feverless after eight weeks' illness. She had quinine and hydrobromic acid upon the conviction that I entertained that the pyrexia had no organic cause, and I believed it to be neurotic. But I am quite uncertain whether the medicine

did her good, as the temperature continued for many days after it was given in full doses (gr. iv ter die).

In both these cases there was a marked nervous element, the boy had had chorea and possibly tetany, the girl had had epileptic fits. Both suffered a considerable, the boy remarkable, fever, and no harm seemed to accrue therefrom. It is certainly a most instructive thing that for six months a patient should have, without any ill effect, such aberrations of temperature as are there shown.

These are all cases of continued fever of some duration, and if we except the doubtful typhoid I was unable to give a name to, I think I could without difficulty have singled out some even more striking examples. Certainly I could have given many more of the same kind, and no doubt everyone will agree that pyrexia of this sort, which cannot be ticketed, constitutes one of the most common and withal perplexing occurrences of practice.

I have said nothing about simple continued fever, nothing about paradoxical temperatures, as they have been called, because "simple continued fever" seems a term without meaning. What causes simple continued fever is just what we want to know. Is it due always to one cause, or is it the outcome of many different ones, which by-and-by we shall reduce to some ultimate analysis?

Paradoxical temperatures, on the other hand, are more strange and contrary to experience than some I have given, chiefly in the extreme height to which they have reached, and perhaps by the rapidity with which they have fluctuated.

But this is a matter only of degree,—the disorder of the mechanism would seem to be the same.

The more we study the thermometry of disease, the more it appears that it is much more special to the individual than it is to the disease. I am shown, for instance, a chart of a doubtful case and asked if it be not like that of typhoid fever. To this I reply, What is a typical typhoid chart? There is very little else than its *duration*, and the proper *duration* of typhoid, as everyone knows, is as often honoured by the breach as by the observance.

The surface temperature of disease, too, is now very often taken every two, three, or four hours, and with charts thus

elaborated it is most difficult to single out criteria of any particular febrile state (Pneumonic Chart, 9). There are indeed few temperature charts typical of anything. There are certain organisms that, being introduced and leading their life, tend to provoke fever in the host, which at their death subsides; and thus, to a certain degree, there is uniformity of length in all that are of like kind. But that is about all. Most of the rest of the pattern of the chart is due to the individual resistance, or want of it, on the part of the tissues and centres provoked.

The varieties of disturbance that produce fever, and the rapidity of their action; the varied manifestations of fever in this individual and that; the variations in the curve in different individuals suffering from disease of one kind,—all these supply strong evidence in favour of the predominant influence of the nervous system in the regulation of the production and the discharge of heat, and hence comes, I think, mainly the important and valuable suggestion that drugs may be of value in restoring the tone of the disordered centre.

Antipyrin, thallin, and antifebrin or acetanilide are the three most generally known and used drugs for this object, and it must be allowed that they are all fairly safe and sure antipyretics, that is to say, that within a short time of their administration the temperature of the patient is pretty sure to fall.

I will, for, the minute, reserve my own opinion on the merits of these remedies, to make the remark that not only does clinical medicine furnish evidence in favour of a heat-regulating centre, but also, as I have wished some of the cases to show, that in the main we have, in practice, to deal with two groups of cases,—those in which the pyrexia is harmful to the patient; those in which it seems to do no harm. In the one case it seems probable that thermogenesis is increased, the body heat is generally higher, and the tissues suffer. In the other there is some want of adjustment between heat production and heat loss, perhaps local in its manifestations, the temperature runs up and down with strange vagaries, and the patient seems to suffer little or nothing.

Now, it seems that it is in this group of cases, where the adjusting centre is working badly, that antipyretics might possibly be of use in toning it up to a sense of its duties and

to a better discharge of its functions. In the other, where thermogenesis is increased and matters are, consequently, more entirely at fault, it might be doubted whether much could be done.

But from what I have already said, this is equivalent to saying that, in those cases where nothing need be done, antipyretics are of value, and that in those that are urgently in want of something to arrest the fever nothing *can* be done. And this is much my own opinion at present as regards this new class of drugs. But the case against them is not so extreme as this, because a large number of cases are met with in which both thermotaxis and thermogenesis, to adopt Dr. Macalister's terms, are suddenly put out of order, and by mending matters in one direction things are bettered in the other. As an illustration of this class, I may quote rheumatic hyperpyrexia in which the adjusting arrangement between production and loss would seem to be chiefly and first at fault. Heat loss is at a standstill or insufficient to neutralise heat production, and the temperature rapidly runs up. The suddenness of the onset, the rapid spoiling of the tissues, and the speedy death, suggest some sudden nerve disturbance which, being righted, might save the patient; and we have now many cases on record where a cold bath has plainly rescued the patient from the jaws of death. I think in these cases there is much to be hoped of antipyretics. I am under the belief that I saved a patient from becoming hyperpyretic by antifebrin last year.

A girl of seventeen was under my care for a second attack of rheumatism. She had been ill about a week. The affection was pretty general, there was sore-throat, but no definite cardiac affection, and she was given salicylate of soda, twenty-grain doses every four hours, but this produced rather obstinate vomiting, and so was discontinued after two or three days, quinine being given in three-grain doses instead. All pain had ceased and she was again on a fish diet when, after a fortnight, she suddenly had a relapse (Chart 10). On going round the ward I found her temperature had run up to 104·6°, a temperature unusually high for simple rheumatic fever. I put her at once upon antifebrin, three-grain doses, to be repeated in an hour's time if the temperature were not falling. By

this means it was easily kept below 103°, although it shot up once or twice after.

But, for the rest, I cannot say that I have seen much certain good from antipyretics. I have tried antipyrin, thallin sulphate, and antifebrin, and of late I have always used the last-named, as it is much cheaper and I have seen no bad results from it. They all are pretty certain in their antipyretic action unless the condition is a desperate one—when, like emetics in their appropriate cases, they will fail to act—but they do not cut short the fever; I cannot say that they influence it for good in the majority of cases. After a time they lose, I think, their effect; or the thermotaxic centre becomes irritable and the temperature jumps up and down many times in the course of twenty-four hours. I have given it chiefly in typhoid fever, and then sometimes to anticipate particular tendencies to run up, sometimes twice or three times a day, to attempt to keep the temperature below a certain level. I have given it frequently in phthisis in this way, without benefit (Chart 11). I have given it in pneumonia, in meningitis, and in many other indefinite febrile states, such as those I have alluded to under the name of innominate fever.

But I doubt if the present state of our knowledge will allow us as yet to do much more than distinguish broadly the two classes of cases I have indicated,—those in which the fever is obviously prejudicial to the recovery of the patient; and those, a large number, in which, although the fever, as judged by the thermometer, may be severe, it would not appear to do any appreciable, or at any rate excessive, harm. In this large class of cases I have repeatedly given antipyretics and, as a result, so little am I sure of any good having accrued, I incline more and more to let them alone. The balance is restored by natural processes in these cases, and I confess that until more is known about the conditions under which pyrexia is produced antipyretic drugs, in my opinion, are better confined to carefully-considered conditions than, as now is often the case, put down the throat of anyone with a temperature above 103°. And in the other class of cases we must still live on in hope. No doubt in the future—for we are fast being devitalised and converted into machines—we

shall know more about, and shall be able to read more certainly in the aspects of the particular case, the particular fault which needs a remedy, whether it be an ataxia of the heat centre, an increased combustion, or a decreased discharge, according to Macalister's hypothesis, and then, may be, we shall be able to apply the particular antipyretic suited to the case. For instance, I can quite conceive that if we could say in any given case that the heat-discharging office was in abeyance it might be possible, by giving a dose of pilocarpin and initiating an increase of heat loss by a copious sweating, to right the balance and to cure the fever. That, in other cases, quinine, salicine, antipyrin, or antifebrin might work best by some central nerve control; in others the application of cold. But we must wait at present. Antipyretics have been described by some in enthusiastic terms for the sharp febrile states that are met with in childhood, and I am far from saying that in such cases they may not be of use. These are indeed just the cases—like the one of threatened hyperpyrexia already given—in which they may be of much service, but at the same time it will occur to all that the attacks, in which they thus seem to be so beneficial, are just those whose nature is to subside as suddenly as they come, and I do not think that the evidence at present to hand is quite conclusive in favour of the drugs.

It will be understood that this is by no means the last word that has to be said on this question. It merely professes to be a record of individual opinion after an extended trial over a somewhat indiscriminate field, and there are obvious uses of these drugs, apart from their antipyretic action, which may possibly teach us something of their *modus operandi* in the control of fever. The action of antipyrin in dissipating some forms of headache, and other neuralgic affections, its apparent value in some cases of chorea, &c., are to my mind very full of significance and suggestive of thought in this respect.

In conclusion, I am not unmindful that cold, the best of all antipyretics, has been left without mention. The reason is not that I do not value it and often make use of it, but because I am so much impressed with its value, and could give so many illustrations of its use in acute inflammatory cases, that it may better form the subject of separate consideration.

Charts illustrating Dr. Goodhart's paper on Innominate Fever and Antipyretics.

CHART 1.

A man, æt. 30.

The temperature for the first four days was taken morning and evening—after that every four hours, at 6, 10, 2, &c.

The pulse, at first 94, fell slowly to 75; the respirations, 24 at first, fell to 20.

CHART 2.

A child, æt. 6½.

Temperatures taken morning and evening at 9 a.m. and 9 p.m.

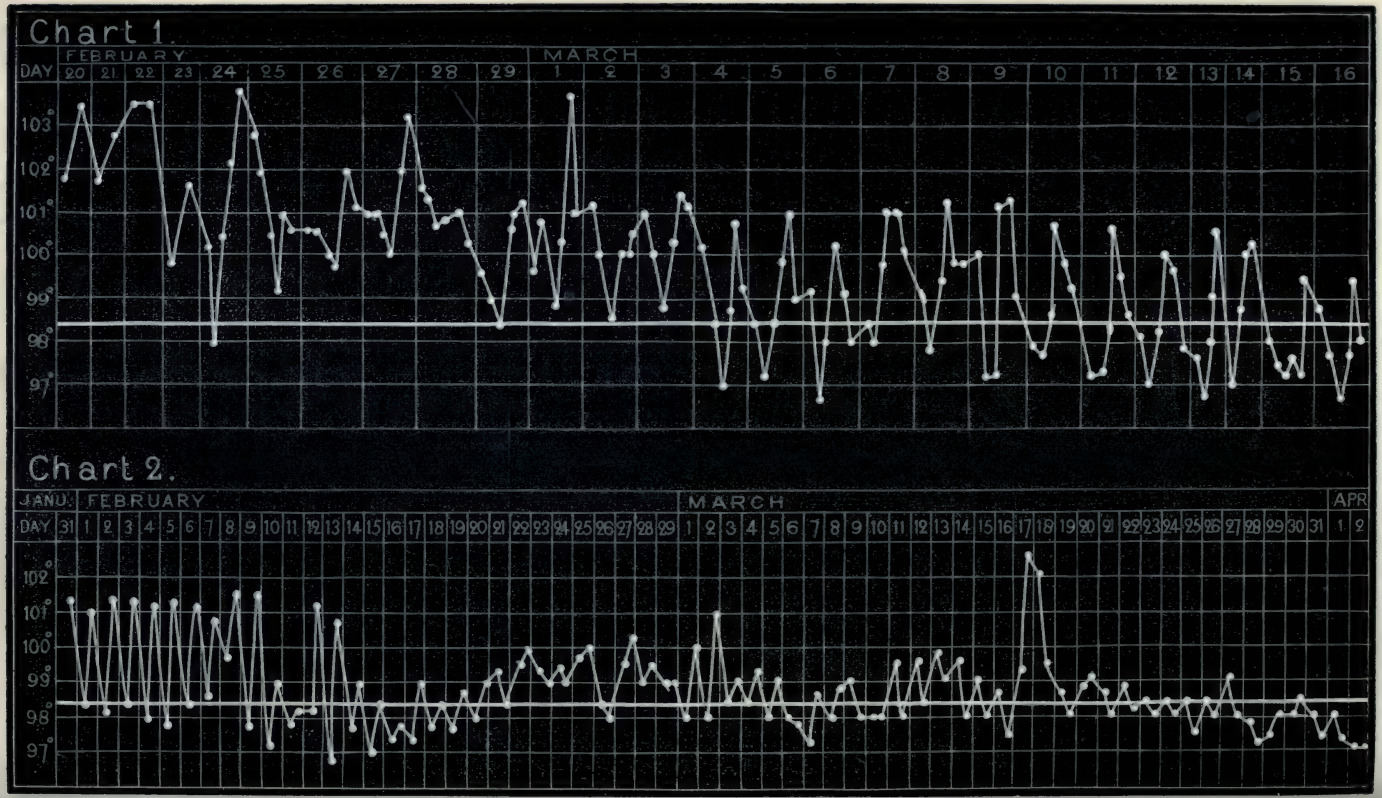
Chart 1.
FEBRUARY
MARCH
DAY 20 21 22 23 24 25 26 27 28 29 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
103°
102°
101°
100°
99°
98°
97°
Chart 2.
JANU. FEBRUARY
MARCH
APR
DAY 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2
102°
101°
100°
99°
98°
97°

CHART 3.

A boy, æt. 2½.

The temperatures were taken about 10 a.m. and 6 p.m. Extra observations were made as follows:

January 9	...	101·4°	.. 10 p.m.
11	...	101	... 2 a.m.
12	...	101·3	... 6 a.m.
13	...	102·6	... 6 a.m.
17	...	103·4	... 6 a.m.

The highest records after this were most of them obtained at 10 p.m.

CHART 4.

A girl, æt. 17.

Temperatures taken every four hours, 2, 6, 10, &c.

Chart 3.
JANUARY
FEBRUARY
DAY
6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
104°
103°
102°
101°
100°
99°
98°
97°
Chart 4.
DAY
13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
103°
102°
101°
100°
99°
98°
97°

CHART 5.

A woman, æt. 21.

Shows morning and evening temperatures.

CHART 6.

A girl, æt. 14.

The vertical line to 103° on the 18th indicates the reduction brought about by sponging.

Ice poultices were applied at the next observation and continued afterwards.

Temperatures were taken every four hours, at 2, 6, 10, &c.

The pulse averaged about 140, the respirations 48.

CHART 7.

A boy, æt. 8.

The temperatures were taken every four hours, but the Chart being too voluminous for publication, I have taken the highest and lowest daily records.

From February 6th to 14th, antifebrin, gr. v, and then antipyrin, gr. x, was administered daily at 10 and 5.

From the 18th to the 21st a daily dose of five grains of antifebrin was administered at 5 a.m., the time of the recorded observation. The extreme oscillations, therefore, at these times represent the action of these drugs.

After the last observation recorded in this Chart he went to a convalescent home, and was readmitted under one of my colleagues from April 14th to July 1st. All this time his temperature was much as is here shown, and he left the hospital finally *in statu quo*.

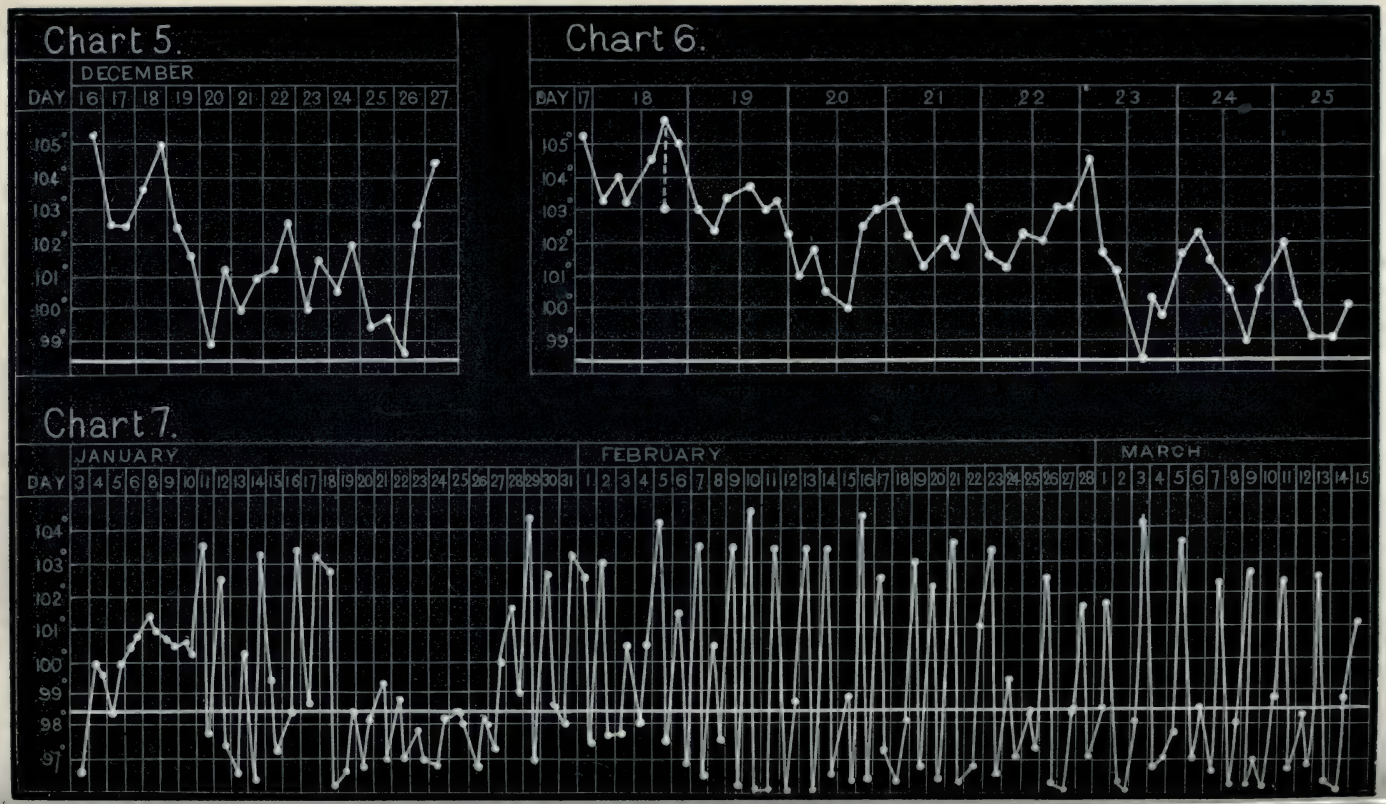
Chart 5.
DECEMBER
DAY 16 17 18 19 20 21 22 23 24 25 26 27
105° 104° 103° 102° 101° 100° 99°
Chart 6.
DAY 17 18 19 20 21 22 23 24 25
105° 104° 103° 102° 101° 100° 99°
Chart 7.
JANUARY
FEBRUARY
MARCH
DAY 3 4 5 6 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
104° 103° 102° 101° 100° 99° 98° 97°

CHART 8.

A girl, æt. 14.

Supposed chill on February 14th; all that week languor and headache. From February 21st to March 8th the morning temperature was 99° to 101°; the evening, 101° to 103°. Quinine (gr. ij), with hydrobromic acid, commenced on April 6th, and increased to gr. iv ter die on the 14th.

The pulse averaged 80 to 96.

CHART 11.

A man, æt. 33, who suffered from chronic phthisis with pyrexia.

It is recorded to show the effect of antifebrin in a case of this kind.

It was given in five-grain doses, commencing on February 6th. Up to and including the 9th it was given at 4 p.m., the temperatures being taken every six hours, 6, 12, 6, 12. On the 10th and 11th it was given at 8 a.m. and 4 p.m., and on the 12th at 8 a.m.; it was then discontinued, and the patient left the hospital soon after.

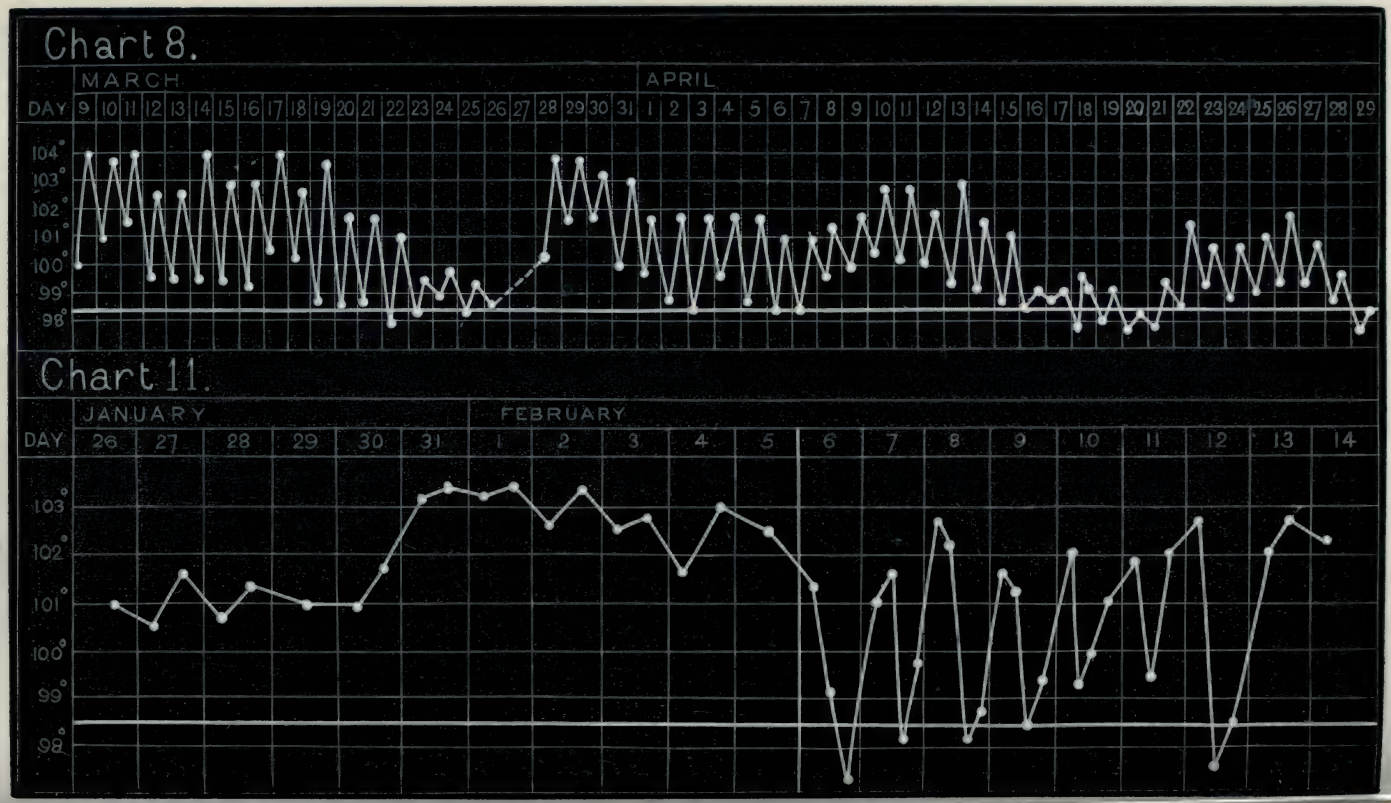
Chart 8.
MARCH
APRIL
DAY
9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
104°
103°
102°
101°
100°
99°
98°
Chart 11.
JANUARY
FEBRUARY
DAY
26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14
103°
102°
101°
100°
99°
98°

CHART 9.

A child, æt. 7, with acute pneumonia of the left side.

The temperatures were taken every hour, or nearly so, after the 28th.

Antifebrin was given, and ice-bags applied continuously to the chest, but without any remarkable effect.

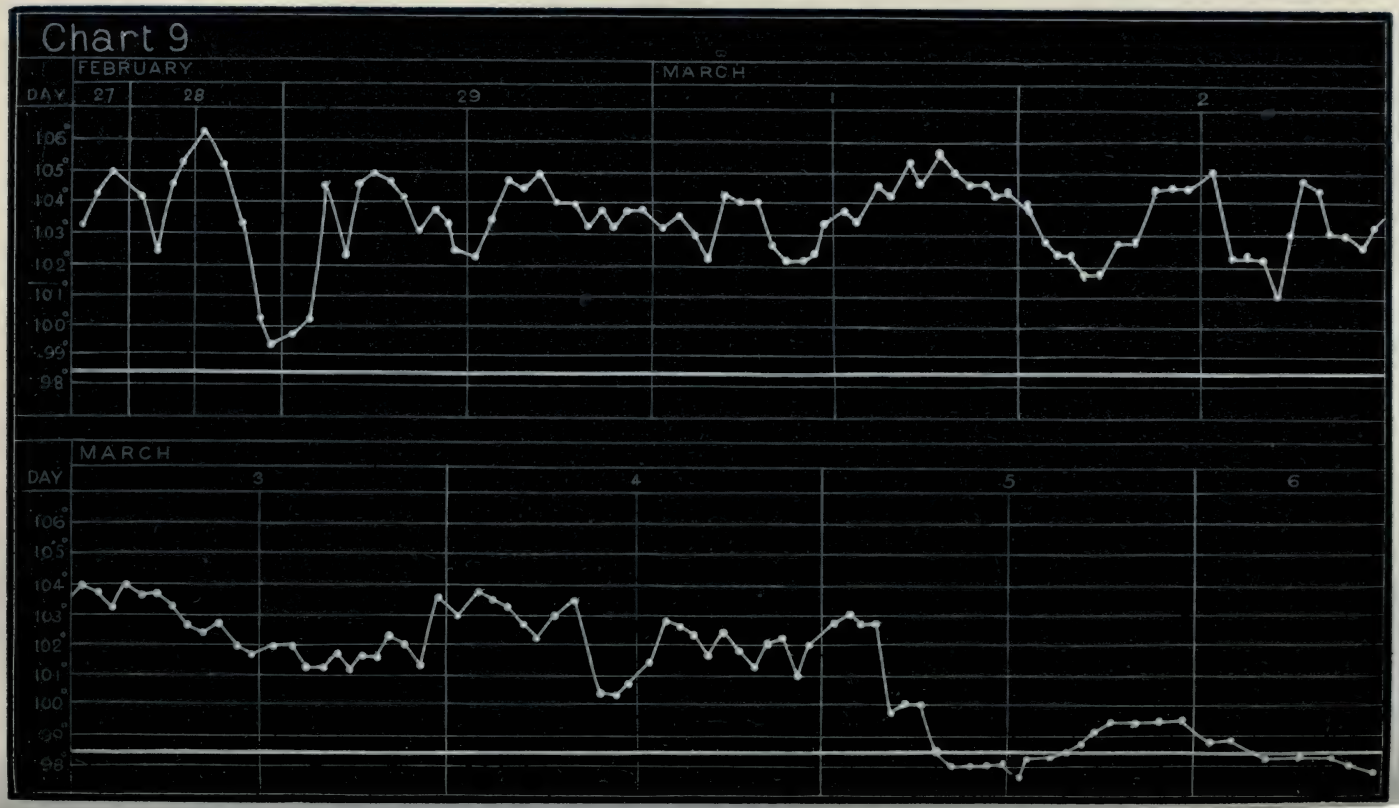
Chart 9
FEBRUARY
MARCH
DAY
27
28
29
1
2
106°
105°
104°
103°
102°
101°
100°
99°
98°
MARCH
DAY
3
4
5
6
106°
105°
104°
103°
102°
101°
100°
99°
98°

CHART 10.

A girl, æt. 17; acute rheumatism.

Temperatures taken from 18th onwards every two hours from 2 p.m.

Antifebrin, gr. iij, was given at 2 and 8 on the 18th, at 8 a.m. and 4 p.m. on the 19th, and gr. v at 4 a.m., noon, and 6 p.m. on the 22nd.

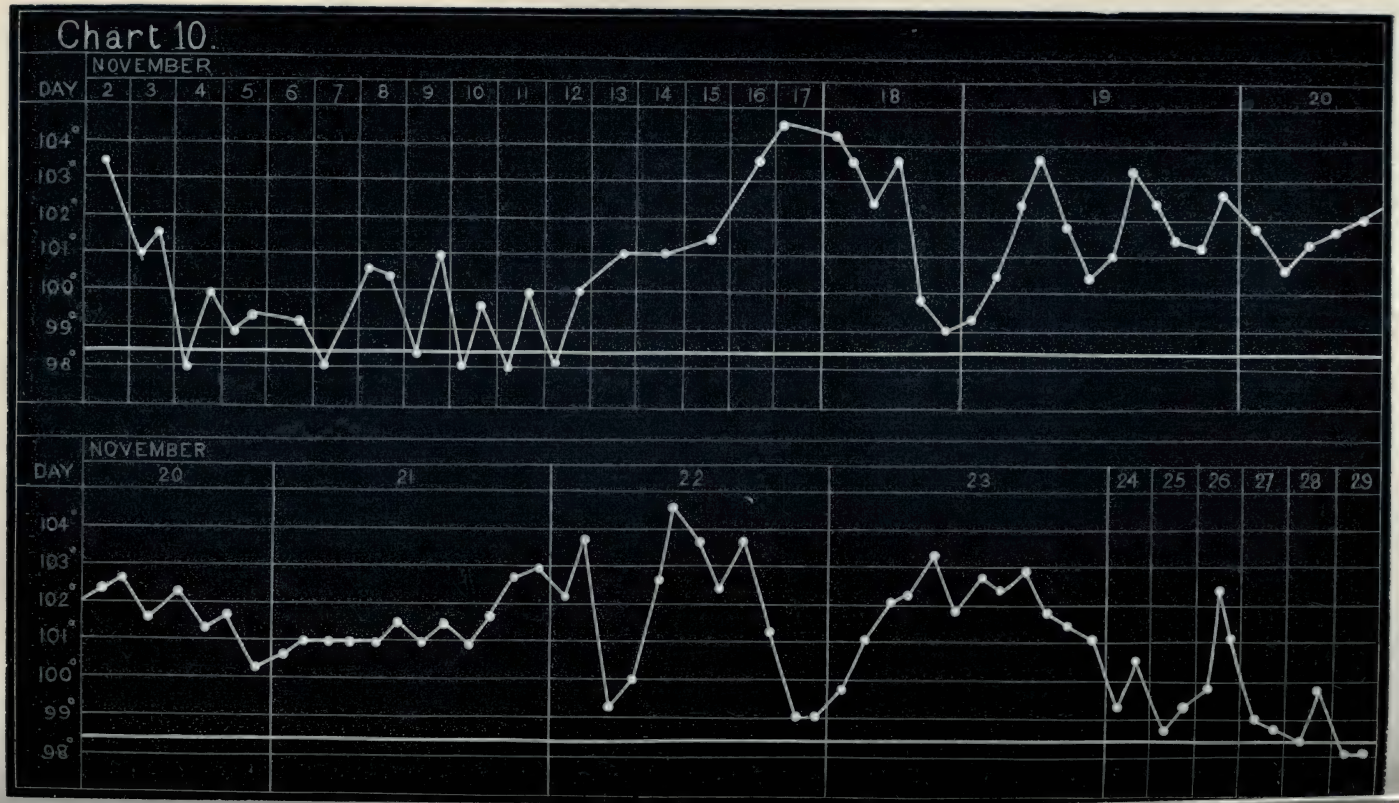
Chart 10.
NOVEMBER
DAY
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
104°
103°
102°
101°
100°
99°
98°
NOVEMBER
DAY
20 21 22 23 24 25 26 27 28 29
104°
103°
102°
101°
100°
99°
98°

THE IMPORTANCE OF PERITONEAL EFFUSIONS:[1]

(1) AFTER ABDOMINAL OPERATIONS.
(2) IN ACUTE PERITONITIS.
(3) IN TUBERCULAR PERITONITIS.

By R. LAWFORD KNAGGS, B.C.

(Communicated by T. BRYANT.)

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(1) After Abdominal Operations.

In the 'British Medical Journal' for 1881-2, there appeared some remarkable papers by Dr. Marion Sims. The great point and aim of these papers was to show that the cause of death, after abdominal injuries and operations, was the decomposition of the blood-stained serum that was effused into the peritoneum.

The position was ably supported by a record of numerous cases of gun-shot injuries of the peritoneum, in which recovery by natural processes was shown to follow closely upon adequate drainage of fluid from the peritoneal cavity.

Notwithstanding the remarkable success of the abdominal surgery of the present day, the septic conditions which occasionally develop after operations are but imperfectly understood, even by many who have attained some proficiency in this particular department.

[1] A paper read before the Guy's Physical Society on October 1st, 1888.

In his work on 'The Diagnosis and Surgical Treatment of Abdominal Tumours,' 1885, Sir Spencer Wells gives a very interesting account of the gradual growth of his own views.

In 'Diseases of the Ovaries,' 1883, Mr. Lawson Tait discusses the subject at considerable length, but chiefly with regard to the value of Listerism. And in the latest work on 'Abdominal Surgery'[1] no reference to this subject occurs at all.

The impression exists in the minds of many that Listerism has abolished septicæmia from the region of practical discussion. Those who have most experience, and write most on these subjects, and to whom we naturally look to increase our knowledge, either never have a death, or if so unfortunate, are able to account for it without difficulty. How then can we expect to hear from them as to the conditions associated with death in the practice of less successful surgeons, when in their hands this result might have been avoided?

But is it not conceivable that the unsatisfactory symptoms which develop even in their practice, but do not lead to death, are attributed to one cause, whilst in reality they are due to another? Is it not possible, for instance, that the peritonitis, which some surgeons believe they cure by active purgation, may be a condition of a different character, although closely similar?

If active purgation is of such value in peritonitis, why did it fail to hold its ground when it used to be regularly advocated in vigorous language by so admired and distinguished a teacher as Sir Astley Cooper?[2]

When patients who have undergone an abdominal operation do not progress, it is usually, at least during the patient's life, thought that the reason for this is that they have peritonitis. Often no other than a symptomatic diagnosis is attempted—such as hyperpyrexia—and septicæmia is rarely, if ever, diagnosed.

After a careful examination of his notes of post-mortem examinations, the writer finds that it has rarely fallen to his

[1] Dr. Greig Smith, 1887.

[2] 'Lectures on the Principles and Practice of Surgery,' by Sir Astley Cooper, Bart., 8th edit., 1835, p. 223.

lot to see a case of ovariotomy, or one of a kindred nature, in which the signs of peritonitis, when present at all, were other than of the most insignificant character, and quite insufficient to account for death.[1]

The faintly marked "suction lines," which are the most noticeable condition of the peritoneal lining that he has seen, appear to be more of a passive condition than the commencement of an active peritoneal congestion. This appearance, which is probably dependent upon distension of the intestines and paresis of the blood-vessels, results partly from the mode of death and the shock of the operation, and perhaps also from the sudden relief of intra-abdominal pressure. In several of these instances peritonitis was diagnosed before death.

And this is not only a bedside error, for death has often been attributed by the pathologist, as the writer thinks erroneously, to peritonitis, when the only conditions present have been these faint "suction lines," and a quantity of blood-stained or turbid serum in the pelvis. It is this blood-stained or turbid serum that is the most constant and marked condition found in this class of cases after death. It is often sponged out, as Marion Sims describes, with the remark, "Only some fluid in the pelvis," and no importance is attributed to it. The writer has seen it escape from an abdomen reopened on the sixth day after operation, because the progress was unsatisfactory, and though nothing else was found to account for the symptoms, no importance was attached to the circumstance by the leading specialist who operated. But this blood-stained fluid is a very important factor, and the purpose of this paper is to consider its bearing upon the after-progress of abdominal operations, and its significance as a cause of death.

[1] Just recently I have seen, however, an instance in which there was an undoubted localised peritonitis, in which "suction lines" were strongly marked, lymph was deposited upon the surface of the bowel, and the fluid effused was purulent in character; but in the same abdomen there was a considerable quantity of blood-stained serum, and when the intestines were disturbed the difference in character between the two fluids as they blended was very marked. The intestines, except in the region already described, showed no sign of peritonitis, save faint "suction lines." The peritonitis was at the spot where there had been much stripping of adhesions, and a drainage-tube had been used.

Importance has long been attached to keeping the peritoneum free from effusion and blood-clot after operation, by careful "toilet" as it is termed, neglect of this being regarded as a source of septic mischief. The writer has in his possession a letter from Mr. Thomas Keith, written in 1869, in which he describes the methods he employs to promote absorption of any blood and fluid that may have been left behind, and to check effusion. He adds, "I think, however, that one cannot be too careful in sponging up all blood, and not shutting up till all oozing has entirely ceased." His reason for this, though not expressed, is obvious.

With the desire to remove this peritoneal effusion came in the use of the drainage-tube, respecting which so much controversy has arisen. The effusion in itself is not considered necessarily harmful. Mr. Knowsley Thornton writes, "If all is thoroughly aseptic, and the peritoneum is closed, much of the effused serum is rapidly reabsorbed by the peritoneum, and aids in keeping up the patient's strength, whilst draining it away results in more or less exhaustion."[1] But the fluid that according to this view is a source of strength, may become a potent cause of evil; and it is not easy to decide from its appearance the precise point at which a harmless and perhaps useful effusion may be converted into a dangerous and poisonous fluid. How poisonous it may become is shown by the following important passage.

"I have seen," says Dr. Sims, "nausea, vomiting, exhaustion, incoherent talking, dizziness verging into coma, instantly relieved by washing out two or three teaspoonfuls of turbid, sero-purulent matter from a septic pus-pouch behind the body of the uterus; and then in two or three hours more, all those symptoms of prostration and blood-poisoning would be reproduced and then relieved in the same way, again and again, till a counter-opening was made in the bottom of the sac, which permitted continuous drainage through the vaginal *cul-de-sac*. This saved the life of the patient! . . . Let me repeat that there is no more reason why the system should not be overwhelmed by the rapid absorption of concentrated septic fluids than by the rapid absorption of an overdose of morphia. Opium in

[1] 'Med.-Chir. Trans.,' vol. lxiv, 1881, p. 148.

sufficient quantities may kill in from eight to ten hours. Septicæmia may do the same thing often in less time."[1]

Dr. Marion Sims speaks of this condition as septicæmia, and this term is still used by those who distinguish this mode of death after abdominal operations from peritonitis. Septicæmia is described as "an acute (specific) infectious disease, the poison of which is usually inoculated in very small quantities, therefore multiplies in the system, and consequently is probably a micro-organism."[2]

Septicæmia in its acute form generally proves fatal. It differs from the condition to which reference is now being made, and which Dr. Sims compared in 1882 to the action of a drug upon the system, and experimental pathology has since shown that this latter is probably produced by the entrance of a toxic "chemical substance into the blood stream."

This condition is now described by the term sapremia, and the writer is entirely in accord with the protest made by the distinguished writer on this subject in Heath's 'Dictionary of Surgery,' when he says, "The indiscriminate application of the term septicæmia to both these very different affections has caused much useless discussion among the learned, and much confusion to students."

The disease thus designated, and which is usually associated with a collection of blood-stained or turbid serum in the pelvis, is a very different and distinct affection from the septicæmia which is occasionally seen in the wards after other operations.

In septicæmia the disease usually runs a longer course, is marked by profuse sweats, diarrhœa, more or less pyrexia, and a train of nervous symptoms which leave little doubt as to the diagnosis.

In sapremia, as it occurs after abdominal operations, the course is insidious in its commencement, and progresses with alarming rapidity. In the cases which have come under the writer's observation death usually occurred on the second, third, or fourth day. The pyrexia may be slight or suddenly develop into hyperpyrexia. Vomiting, as well as abdominal pain, is generally present; both are perhaps

[1] 'Brit. Med. Journ.,' February 11th, 1882, p. 185.

[2] Victor Horsley, Heath's 'Dictionary of Surgery.'

controlled by the use of morphia. There is often abdominal distension, or this may suddenly develop towards the end.

In all cases, a recent and serious operation helps to obscure the true condition. The most constant and reliable symptom would seem to be the increasingly rapid pulse. The extreme gravity of the case is seldom recognised till near the end.

Mr. Knowsley Thornton remarks that proceedings for the removal of decomposing fluid are rarely successful, "as the blood-poisoning has generally gone too far before accumulation is suspected, or before the surgeon can make up his mind to interfere."[1]

The writer can testify to the truth of this. He has twice seen the abdomen reopened to remove the effusion. One patient died during the operation, the other an hour or two after.

When an abdominal case dies in the vague and unsatisfactory manner described, a collection of blood-stained or turbid fluid in the pelvis will generally be found. It is usually present in a quantity varying from half a pint to two pints, and in one case a drainage-tube had completely failed to remove it.

When patients do well, all blood-stained fluid has probably disappeared at the end of a few days after the operation. The writer had the privilege of watching two cases which were progressing satisfactorily when death occurred, in one from syncope due to a fatty heart on the seventh day, and in the other on the third or fourth day from an accident. In both these cases the pelvis was quite free from fluid.

Now, the peritoneum is a cavity in direct and free communication with the lymphatic system, and capable under suitable conditions of absorbing fluids and air contained within it, with great rapidity. This important function plays a great part in the relation of intra-peritoneal fluids to septic infection, and to understand the subject it is necessary to have a clear notion of the modes by which this may be influenced.

Mr. Watson Cheyne, in his very interesting and valuable

[1] Heath's 'Dict. of Pract. Surgery,' vol. ii, p. 158.

lectures on Suppuration and Septic Disease[1], has pointed out that "apparently the rapidity of absorption of fluid depends in the first place to a great extent upon the tension under which the fluid is; fluid under low tension, as when the walls of the abdomen are lax, or when the fluid itself is small in amount, being absorbed comparatively slowly; and in the second place upon the nature of the fluid; fluid of lower specific gravity than blood-serum leading in the first instance to transudation from the blood." General conditions must also have great influence. When the vital powers have been very depressed after a very prolonged operation, or when shock is severe or feebly withstood, the absorptive power of the peritoneum is likely to be seriously impaired (*vide* cases). Moreover, the sudden diminution of tension consequent upon the removal of a large tumour, will favour an effusion from the blood into the peritoneum.

The equilibrium between absorption and effusion may be disturbed from a variety of causes, and after most abdominal operations one or more of these causes is almost certain to be acting. Even if the disturbance be prolonged, and the resulting effusion considerable, no harm follows, provided that all septic influences have been effectually excluded. But air must have found entrance to the peritoneum, and it is very difficult to be sure that it has been thoroughly sterilised. Nor must it be forgotten that in close proximity to the fluid are the septic gases of the alimentary canal, and as the serous covering of the bowel is likely to have suffered abrasions of its epithelium during the operation, one can readily see how easily any bloody fluid remaining within the peritoneal cavity may become infected from this source.

It has been shown by experiment that if putrescible fluids and air are present in the peritoneum, they may both be absorbed before there is time for decomposition to occur. Doubtless this is what takes place in many of the abdominal cases which recover. But if the quantity of fluid is too great to be quickly absorbed, the unabsorbed residue becomes the medium for the growth of the atmospheric micro-organisms.[2]

[1] 'Brit. Med. Journ.,' March 10th, 1888.

[2] Ibid., p. 524.

These develop with extraordinary rapidity, and give rise to those poisonous chemical products of micro-organic growth, which produce by their absorption the alarming symptoms which culminate in death by sapremia. Considering how difficult it is to prove that absolute Listerism has secured complete asepsis, and further, that non-Listerian operators are able to obtain in abdominal surgery a success at least equal, and in some instances even superior, to that obtained by rigid Listerians, the writer is inclined to infer—

1st. That the length of time during which these putrescible peritoneal fluids remain unabsorbed, has a distinct relation to the occurrence of septic changes in them.

2nd. That the superior success of certain operators, whether Listerian or not, is to be attributed to the circumstance, that, in consequence of greater skill, their patients are less frequently reduced to a condition in which the powers of absorption are in temporary abeyance, or so greatly impaired as to be unequal to the task of removing the effusion which results.

This furnishes a reason for the imperfect success of less experienced operators, who, notwithstanding much care and rigid adherence to Listerian details, yet have the misfortune to lose their cases in this way.

The practised performer of abdominal operations is bolder, more thorough, and quicker at his work. Details are arranged before the operation, and unexpected complications are dealt with by the simplest means. The exact thing to be done has not to be thought out at the time, nor must he wait until colleagues have been consulted. As a result, there is shorter operation, less shock, and inferentially greater readiness to absorb the resulting effusion. As this department of surgery (abdominal surgery) is better taught in the schools, it will be drawn more and more out of the grasp of specialists, with very manifest advantage to the general surgery of the day. So long as the specialist can point to the greater percentage of his success, he can establish his claim to his speciality; but when the hospital surgeon can produce equally good results, the necessity for specialism is gone. Abdominal surgery will then rank upon the same lines with the surgery of other regions of the

body, and the whole practice of surgery will be immensely improved and benefited thereby.

The frequent confusion, after abdominal operations, of sapremia with peritonitis has been pointed out, and it is probable that the reason why it is so frequently unassociated with peritonitis is, that pyogenic organisms seem to be necessary for the production of the latter, and these organisms are not frequently present in the air. But even they may become absorbed, and destroyed without giving rise to peritonitis, if the amount of fluid is small, and complete and rapid absorption takes place.[1]

So that, as far as can be gathered from experimental inquiry, rapid absorption of these peritoneal effusions would seem to be the surest preventive of septic changes or of peritonitis.

Before passing from this part of the subject some allusion must be made to the probable value of active purgation, when a quantity of abdominal fluid is accumulating after an abdominal operation.

The purgative after-treatment of abdominal cases is closely associated with Mr. Lawson Tait's name. In his work on 'Diseases of the Ovaries' (p. 315) he attributes much of his success, without having recourse to drainage, to the fact that he had "unconsciously substituted purgation for drainage."

Drainage by the bowels is a recognised method of getting rid of ascitic accumulations, and there is a good deal to be said in favour of promoting the rapid absorption of these dangerous peritoneal effusions in the same way.

The dread of creating much commotion inside an abdominal cavity which has just been closed, and in which a ligatured pedicle exists, together with some uncertainty as to the exact clinical condition in which purgation should be employed, will no doubt have a very considerable influence in restricting the use of this method of treatment. But as knowledge becomes more exact, it will be likely to prove of great value. When it is possible, sufficiently early in the progress of a case, to decide clearly between sapremia and peritonitis, then the purgative plan of treatment will be suitably appreciated,

[1] 'Lectures on Suppuration and Septic Diseases,' by Mr. Watson Cheyne; Grawitz's experiments, 'Brit. Med. Journ.,' March 10th, 1888, p. 524.

and take its proper place in the after-treatment of abdominal operations.

Short abstracts of cases bearing upon the question of peritoneal effusion and absorption.

1. A case of removal of a large malignant ovarian cyst. It was stated that the woman, at the time of operation, was very seriously ill from hæmorrhage within the cyst, and inflammatory changes. She was much collapsed during the operation for its removal, and death took place twelve hours afterwards.

Post-mortem.—"Stomach greatly distended with gaseous contents. There was a little clot close to the ligature, and some old adhesion of the right colon to the abdominal wall. No secondary growths were to be found in any of the organs. *A considerable quantity of clear serous fluid, about a pint or more, was found in the abdominal cavity.*"

2. E. R—, æt. 51, there was a large multilocular ovarian cyst, intimately adherent to the abdominal walls and viscera; it was removed in the usual way, and some escape of the contents into the pelvis having taken place, the abdominal cavity was thoroughly washed out. Prior to the operation there was general œdema of the legs from pressure.

The patient made a good recovery, but there was great trouble during the first three or four days, from copious and frequent vomiting, and it was not until the fifth day that she was able to retain on the stomach any appreciable quantity of fluid food (viz. five ounces of pancreatized milk during the day). The excess of excreted fluid (vomit and urine) over the quantity of fluid food, water and ice, given by mouth and rectum, was most noticeable. Roughly estimated from the case-book, the quantity of fluid excreted amounted to 10½ pints, whilst the quantity ingested would be over-estimated at 6½ pints. The greatest difference was on the third day, when the vomit and urine amounted to at least sixty-five ounces, and the fluid administered to twenty-six ounces. After the fifth day the fluid excreted assumed the natural relations to the quantity taken.

3. A case of simple uncomplicated ovariotomy with undisturbed and satisfactory progress throughout. The fluid received and excreted is here accurately given, viz.:

	Ingested.		Excreted.
1st day . .	8 oz. 3 dr.	...	13 oz.
2nd day . .	14 oz. 5 dr.	...	38 oz.
3rd day . .	20 oz. 5 dr.	...	22 oz.

Cases in which blood-stained serum in the peritoneum was the chief change found after death.

4. Removal of a multilocular ovarian cyst in a woman æt. 40. The next day the temperature was 100°, pulse 140. Pulse continued high, and death occurred thirty-six hours after.

Post-mortem.—"Nothing to account for death. Only *a slight amount of blood-stained serum in the peritoneal cavity.*"

5. K—, æt. 31, a tramp, a bad subject for operation, had a multilocular ovarian cyst removed. There were intimate adhesions to all the surrounding parts, and when the tumour was taken away a cavity was left amongst the adherent intestines. No drainage-tube was used. Operation prolonged. The same night temperature was 101°, pulse 120, very feeble. No vomiting. No pain. Breathing rapid. Nutrient enemata.

Next day pulse rapid, feeble, 120. Abdomen flaccid, moves in respiration. Later, vomits a little brownish fluid. Temp. 102°, pulse 140—160, varying, very feeble. Died in the night.

Post-mortem.—Recent lymph matted the disturbed parts together. *About a pint of blood-stained serum in the pelvis, and in the cavity left amongst the adherent coils by the removal of the tumour, which cavity still persists.* The sigmoid flexure, which had been with difficulty separated from the tumour, was found to contain a perforation the size of a threepenny piece, but no escape of fæces had taken place, and it is probable that it was closed by the recent lymph that fastened down the old adhesions. Lungs: Pus in the tubes; congested. Kidneys: Cortex thin, capsule adherent; pale.

6. Post-mortem on a case in which the uterine appendages had been removed. Death occurred on the second day after the operation. There was *a considerable quantity of thick, turbid, blood-stained fluid in the dependent parts of the abdominal cavity.* Suction-lines were present.

7. A woman, æt. 25, had an ovarian cyst the size of an orange in the left broad ligament. This was removed on October 26th. The operation was an anxious one, and the patient was very bad after it. A drainage-tube was used for fear of hæmorrhage. In the evening the patient had rallied well. Temp. 100°, pulse rapid. Vomiting. Half an ounce of blood-stained fluid removed from the tube.

October 27th.—Doing well, temp. 100°, vomiting ceased.

Evening temperature rose rapidly to 106·6° in spite of cold sponging. Unpleasant discharge (overflow from tube) around the drainage-tube opening.

The lower part of the wound was reopened and the abdomen washed out till the fluid came back clear. Temperature afterwards went down to 101°, pulse 160, resp. 20. Barely conscious. Died in the night.

Post-mortem.—Some blood-stained fluid in the pelvis.

8. F. D—, æt. 26, had an ovarian tumour, and whilst in hospital she had two slight attacks of peritonitis in connection with it. At the operation on February 1st the peritoneum was vascular and red. Ascitic fluid was present in appreciable quantity, and on the posterior surface of the tumour, which was of a malignant character, there was a very fine, thin, evidently recent layer of lymph. Adhesions had probably been prevented by the ascites. After the abdomen was washed out it was carefully dried with sponges.

After-course.—From the time the operation was finished the pulse was very rapid, never under 130. The temperature rose slowly to 102° during the first forty-eight hours, and in the next and last eighteen hours varied from 102°—103°. Vomiting occurred only during the last few hours. No tympanites till a short time before death, when it developed rapidly. Rectal feeding and injections of morphia were resorted to.

Post-mortem.—There was between *a pint and a pint and a half of turbid, blood-stained fluid in the pelvis.* There was slight injection of the intestines. Suction-lines were visible. The ligature was loose in consequence of great shrinking of the pedicle, and the cut surface was covered with an adherent clot. Some small clots lay close to it.

9. S. P—, æt. 25, had a dermoid cyst in left broad ligament. This was removed on March 9th. Shock was severe. Evening temp. 98°, pulse 80, slight vomiting.

10th.—Condition fair in the morning. In the afternoon temp. rose to 102°, pulse rapid, 120—140. Vomiting ceased. Abdominal pain. No distension of abdomen, which moved in respiration.

11th.—Bad night. Pulse 120. Abdomen moves in respiration, but not much; not tender; no distension; peritonitis thought to exist. Evening temp. 103°, at 8 p.m. 105°. The lower part of the wound was opened, the patient being unconscious, and the pelvis irrigated. At the conclusion the patient was found to have died during its progress.

Post-mortem.—Very slight injection of serous layer covering intestines. A little lymph at places in the pelvis, the result most probably of local injury inflicted during the operation. Ecchymosis beneath serous layer at the back of the uterus and in one or two other places. One edge of the peritoneum that should have been included in the sutures closing the wound, was found to have got nipped in a ligature applied to some pelvic tissues; the result was a surface left uncovered by peritoneum on the peritoneal surface of the anterior abdominal wall. *There was a small amount of blood-stained serum in the pelvis* (*teacupful*).

10. Related by Dr. Marion Sims:[1] "In 1864 Sir Joseph Oliffe and myself assisted M. Nélaton in an ovariotomy. There was nothing unusual in the case; it was a multilocular tumour without adhesions, just such a case as would now be promptly and certainly cured. Twenty-four hours after the operation I saw that the patient must die, and told M. Nélaton she was dying from an effusion of a reddish serous fluid in the peritoneal cavity, and I suggested to him then

[1] 'Brit. Med. Journ.,' February 11th, 1882, p. 184

to puncture the cul-de-sac of the vagina to let it run out. It was not done, and she died forty hours after the operation. I assisted M. Nélaton and Sir Joseph Oliffe at the post-mortem examination, and we found precisely what I had predicted, viz. *a large effusion of sero-sanguinolent fluid, a quart or more, in the peritoneal cavity.* She died of septicæmia, but we did not then understand it."

From the same source it appears that Dr. McGuire, President of the Surgical Section of the American Medical Association (June, 1881), recorded four cases in which a bullet "passed transversely and superficially through the walls of the abdomen, wounding or bruising only the peritoneal lining of the abdomen, not perforating it, or wounding the intestine or even the omentum. All of these cases died of septicæmia."

11. "Fully a quart of reddish serum escaped from the pelvis and abdominal cavities during the necropsy."

12. Died three days after wound. "Three pints of red serum in peritoneal cavity."

13 and 14. "Were seen in Confederate soldiers. Both had large quantities of red serum in the peritoneal cavity."

Cases in which the evacuation of blood-stained peritoneal fluid was followed by immediate relief.

15. From Dr. Marion Sims's paper:[1] "In December, 1878, I assisted my friend Mr. Spencer Wells with an ovariotomy in the suburbs of London. Adhesions in the bottom of the pelvis were universal and very strong, and it was difficult to arrest the exudation of blood. When the external wound was being closed Mr. Wells saw that there was some exudation still going on, but thinking that Listerism had rendered it aseptic, he had no fears for the result. The patient did well for about thirty-six hours, when she became rapidly septicæmic, and fears were naturally felt for her safety. Fortunately, just at this juncture bloody serum was found exuding from the lower angle of

[1] 'Brit. Med. Journ.,' December 10th, 1881, p. 925.

the wound. Mr. Wells then removed some of the sutures and opened the wound a little. There was a free discharge of septic fluid, and the patient made a rapid recovery."

16. Recorded in Sir Spencer Wells's "Abdominal Tumours,' p. 109: "I performed ovariotomy on a girl 18 years of age in the Samaritan Hospital on June 13th, 1864. . . . . On the third day after operation some sharp pain came on, which became easier after a uterine discharge like menstruation appeared. She continued doing well till the ninth day, when she was found with dry tongue, dilated pupils, flushed face, and drowsiness. I examined by the vagina and rectum, and detecting fluid between them made a puncture by a trocar, and let out five ounces of dark bloody serum which had a putrid ammoniacal odour" (adhesions to fundus of bladder had been carefully dissected at the operation). "The pulse sank from 112 to 95 and 92, but mucous diarrhœa came on, and the typhoid condition was aggravated next day. As the discharge from the trocar puncture had ceased, and examination detected fluid still in the recto-vaginal space, I made another opening into it, and evacuated ten ounces of fluid still more putrid than that of the day before, and containing pus. I then carried on the trocar through the opening made the day before, and drew a drainage-tube through the cannula without withdrawing it. The tube was then tied and left fixed. I took great care that it should pass through the lowest point where the peritoneum is reflected from the rectum to the vagina.

"Very free discharge came through the tube for several days, and the general condition rapidly improved. The tube was removed on July 1st, and convalescence was rapid."

Case showing the absence of peritoneal effusion, the patient making satisfactory progress, but dying from an accidental intercurrent condition.

17. E. H—, æt. 47. Previously operated upon successfully for lacerated cervix uteri. On October 20th, 1886, both ovaries and Fallopian tubes were removed at her express desire for excessive ovarian tenderness, which compelled her to lead the life of an invalid. Both ovaries were small and

atrophied, but each contained a cyst the size of a large marble. The abdomen was washed out and closed.

She did well for the first four days, except for vomiting, which ceased on the third day. Then left parotitis set in with pyrexia, and as this subsided the right parotid gland also inflamed. On the evening of the seventh day she was doing well, temperature below 100°. The wound was dressed, and she got excited about it. The house surgeon saw her at 1 a.m., when she seemed to be doing well. At 5 a.m. he was sent for, and found her dead; she had died very suddenly.

Post-mortem.—A good deal of venous thrombosis in the left broad ligament giving it a darkish appearance. *No peritonitis. The abdomen was very satisfactory. There was no effusion.* Liver fatty. Heart: Mitral stenosis. Muscle fatty, degeneration of the fibres very marked under the microscope. Parotids swollen, on section exuded reddish grumous-looking juice. Pus in tubes. No localised abscess.

(2) Acute Diffuse Peritonitis.

Severe cases of acute diffuse peritonitis, which prove fatal in a few days, are generally found to be associated with the formation of a variable quantity of inflammatory serous effusion or pus. Till within the last four or five years the treatment of this condition has been extremely unsatisfactory. Indeed, according to Mr. Treves, it was not much more advanced in 1884 than in 1739, when Heister advised that "the patient be kept quiet, that he be urged to eat abstemiously, and to lie upon his belly. The rest is to be left to Divine Providence, and the strength of the constitution."

In 1884 the treatment of acute general peritonitis by laparotomy was first advocated by Mr. Treves, and shown to be a means of obtaining most brilliant cures.

This method of treatment has already been fully justified by results, and discussion now busies itself, not so much with the merits of the method, as with whom the honour of its initiation is to remain.

The essential part of this mode of treatment consists in

the removal of the peritoneal effusion, whether serous or purulent, and the thorough cleansing of the abdominal cavity.

Drainage naturally follows to prevent reaccumulation. The nature of the effusion must be considered in order to understand how death is brought about in acute peritonitis. It is desirable to point out that the term "suppurating peritonitis" is open to some misunderstanding. According to Dr. Fagge "every gradation may occur between the simplest form of fluid inflammatory exudation and that which is in fact pure pus. All depends upon the proportion of leucocytes to serum."[1] The writer has seen slightly turbid serum exuding in large quantities from a penetrating wound of the front of the abdomen, when the patient was moribund from peritonitis. In Mr. Treves's case the fluid was semi-opaque, and mixed with flakes of lymph and pus, and escaped as soon as the abdomen was opened.[2] In Mr. Barwell's case thick pus was found lying in the lower part of the peritoneal cavity.[3] He believes the formation of pus in such quantities as to escape spontaneously when the abdomen is opened, is rarely seen in the diffuse form of acute peritonitis. Personal observation inclines him to the opinion that when the effusion is considerable it is generally turbid and serous; when it is purulent, the quantity is usually small and contained in the pelvis.

It is more usual to meet with pus in the localised form of peritonitis. For these reasons the use of the term suppurative peritonitis seems inexact and unsatisfactory, and its employment in a recent and valuable work introduces an element of vagueness and uncertainty in the portion that treats of this subject.

Acute peritonitis is almost always secondary to some other condition. Now, whether it is produced by the rupture of one of the hollow viscera, or of a localised abscess, as in Mr. Treves's case, or by an extension of some of the various conditions affecting the female genitary organs or other viscera, the irritating products that find their way into the peritoneum and excite acute inflammation and effusion, con-

[1] Fagge's 'Medicine,' vol. ii, p. 240, 1st edit.

[2] 'Med.-Chir. Trans.,' vol. lxviii, 1885.

[3] 'Brit. Med. Journ.,' November 5th, 1887, p. 995.

tain, as a rule, micro-organisms in considerable numbers. The effusion that arises from their introduction into the peritoneal sac promotes their rapid multiplication. In many instances the extravasated fluid contains as well, highly toxic chemical products springing from the germination, growth, and decay of these fungi.

Thus in Mr. Treves's case, there was a pelvic abscess of gonorrhœal origin and two months' duration. During this time the micro-organic life and decay must have steadily concentrated, and the abscess contents become highly septic, as proved by its "stinking" odour, when the abscess burst and discharged its contents into a healthy peritoneum. Inflammation with effusion was at once set up, and in the effusion the organisms would revel and multiply amazingly. As soon as absorption commenced, the ptomaines (*i. e.* the chemical results of the micro-organic life) would gain entrance to the circulation and exert their poisonous influence.

In such a case it would be hardly possible for a peritoneum to dispose safely of the effusion, for such an amount of poison could enter no circulation with impunity.

In many instances then, it may be stated that the originating cause of acute peritonitis is the introduction into the peritoneal cavity of a store of chemical poison of bacterial origin, in addition to the numerous micro-organisms that have been engaged in its production.

The fluid effused and extravasated into the peritoneum is poisonous from the commencement, and consequently the sapremic state rapidly supervenes, and is merged into the shock produced by the sudden extravasation of irritating matter. Shock is often said to be the cause of death under such circumstances, whereas the condition is one more truly of blood-poisoning, which may be successfully treated by adequate operative procedure. Sapremia is the fatal factor, —not shock—which would certainly be intensified by such measures.

The question naturally arises, why, when bacteria and their ptomaines exist in abundance within the abdomen, there should be so great a difference between the effect upon the bodily powers when they are held within a limited space, and when contained within the general peritoneal

cavity? The answer explains the difference between the clinical features of acute diffuse, and localised, peritonitis. When a localised formation of pus occurs, it is preceded and accompanied by plastic inflammation, which, whilst glueing the neighbouring tissues together, leads to the deposit of lymph upon the enclosed peritoneal surface, to the blocking of its stomata, and the impairment of its power of absorption.

If the enclosed pus breaks its bounds with such suddenness that it makes its way into the general peritoneal cavity, it finds itself within a healthy absorbing serous sac, and the inflammation it excites, leading more to the effusion of serum than to the deposition of lymph, tends in no way to diminish mechanically the absorbing function of the peritoneum.

On the other hand, the serous fluid that is exuded provides a rich nutrient fluid for the growth of organisms, and by diluting the extravasated pus brings it in contact with a larger peritoneal surface, and possibly, by giving it a thinner consistency, renders it more capable of ready absorption.

The peritoneum is, in fact, converted into a reservoir or cistern, from which a continuous supply of poisonous material pours through the lymphatics into the circulation.

Those who have read Sir James Paget's account of the way in which he was affected after immersing his hands in the effusion of a case of acute peritonitis when making a post-mortem examination, will always remember how poisonous such effusion may become.

To recapitulate:

Death in peritonitis is due to the deadly properties of the effusion; its complete and early removal is the way to arrest the fatal disease. The effusion is the medium in which micro-organic life can flourish, and the chemical products of these micro-organisms constitute the poison which destroys life. When this fluid is completely removed, an immediate improvement in the symptoms takes place. These facts encourage us to look forward with hope and confidence to the future treatment of this dread disease, for as they are realised, it will be certain to be met with greater promptitude and increased success.

Abstracts of recorded cases in which acute peritonitis was treated by abdominal section.

18. Mr. Frederick Treves records the following case in the 'Med.-Chir. Trans.,' vol. lxviii, 1885:

A single woman, æt. 20, was in the London Hospital for a month with chronic pelvic peritonitis due to extension of gonorrhœal inflammation to the uterus and Fallopian tubes. On February 25th she developed acute peritonitis. On February 26th Mr. Treves found her greatly prostrated, with tense, distended, tympanitic, and tender abdomen. The bowels had ceased to act. There *was constant vomiting, and nothing was retained in the stomach.* Pulse small, weak, frequent. Tongue dry.

The abdomen was opened at once, and a quantity of semi-opaque fluid gushed out, mixed with flakes of lymph and pus. Examination showed that a localised pelvic abscess on the left side containing a large quantity of thin stinking pus had burst its barriers, and escaped into the general peritoneal cavity, and set up acute general peritonitis. The general surface of the peritoneum exhibited the ordinary appearances of acute peritonitis. The intestines were lightly glued together, where they were in contact with one another. The abdomen was washed out and drained.

After-progress.—The patient *only vomited twice after the operation,* probably from the effects of the ether. For four days she was fed by the bowel and morphia given. She suffered from carboluria also. On the fifth day the bowels acted spontaneously. The discharge gradually diminished, and the patient *underwent a rapid and remarkable improvement.* On April 5th she was out in the garden.

19. Another case is recorded by Mr. Barwell in the 'Clinical Society's Transactions,' vol. xxi, 1888.

A man, æt. 42, received an abdominal injury on June 18th, 1887. He continued his work, but on June 23rd symptoms of peritonitis set in. He was admitted to Charing Cross Hospital on June 24th with pinched and anxious expression, small hard pulse, 124, temp. 100·4°, tongue

coated and tremulous. Vomiting on taking food, as well as at other times. Abdomen much swollen and tympanitic.

On the 25th temperature had fallen to 89°, pulse 130. Acute peritonitis was diagnosed, but its cause was uncertain. The abdomen was opened, and a quantity of gas escaped on opening the peritoneum, forming bubbles in a turbid yellow thick fluid. The peritoneum was thick, opaque, and yellowish in colour, and deep in the pelvis was a quantity of thick pus. This was sponged out, and the abdomen washed out and closed. No drainage-tube.

26th.—Patient slept during night. Vomits frequently. Temp. 99°, pulse fuller. Abdomen scarcely at all distended. Says that he feels quite well, and wants to go home.

28th.—Bowels acted four times during night; afterwards the vomiting stopped; all bad symptoms much relieved.

On the 29th the man was out of danger.

The two preceding cases show how immediate improvement, leading to rapid recovery, follows on the evacuation of the inflammatory effusion and the cleansing of the peritoneal cavity in acute general peritonitis.

It is worthy of note that in the case in which the effusion was thick and flocculent and in relatively small quantity, the symptoms were milder and advanced less rapidly than in the first case, in which the effusion was more abundant and more fluid.

The following case brings into striking contrast acute general peritonitis in which the effusion is plastic, and acute peritonitis, even localised, in which the effusion is fluid.

The septic influences which were present in this instance, doubtless assisted to determine the character of the effusion.

Case of acute septic peritonitis; operation; recovery (recorded by Mr. Victor Horsley[1]*).*

20. A woman, æt. 43, said to have had a right femoral hernia recently reduced, was admitted on July 28th, 1885, to University College Hospital, suffering from acute peritonitis, and with a hard tender swelling at the saphenous opening on right side.

[1] 'Medical Times,' Sept. 26th, 1885, p. 431.

"On admission, patient was found to be a small spare woman lying on her back with knees drawn up, complaining of intense pain in the abdomen. Face brown and pinched, eyes deeply sunken, with dark rings round each, countenance expressive of great pain and exhaustion. Temp. 100·2°, pulse fairly strong and regular."

Mr. Horsley explored the tumour in the groin, which proved to be an inflamed gland, adherent to a shrunken and almost sloughing hernial sac. This was opened and about two ounces of horribly fetid pus gushed out from a localised abscess inside the peritoneum. The cavity was washed and drained. After the operation the temperature quickly fell to normal, and the patient was evidently benefited.

July 28th.—Leeches to epigastrium where pain was intense. Very sick during whole day.

29th.—Still frequently sick. Relaxed motion.

30th.—Not so sick. Temp. 98·4°, pulse 86, resp. 30.

31st.—Only sick once. Legs now stretched out, but belly very tender. Hot fomentations since 29th.

August 1st.—Patient not sick. From this date the patient made a steady recovery. The tenderness in the abdomen gradually lessened, but still remained at epigastrium and right iliac fossa, even when the patient left the hospital. When walking about she said she felt "as if her internals were tied together."

In this case the peritonitis involved the whole cavity, though the abscess was more or less localised. The surgical treatment of the latter would have no material bearing upon the progress towards recovery of the general peritoneal condition, beyond preventing a further extension of mischief from the abscess cavity; but had the septic contents been allowed to remain, there can be little doubt that death could not have been long delayed.

The following case is inserted for the purpose of contrasting the symptoms of a localised acute peritonitis with those of the general condition, which have been described in the foregoing cases:

21. In the 'Medical Chronicle' for November, 1887, p. 107, Mr. Robertson records the case of a child, æt. 3

years and 8 months, who received an abdominal injury on December 31st, 1885. Gradually he became fretful and lost appetite, and the bowels became irregular; frequently complained of pain in his belly, and his mother noticed it was tender on the right side.

On April 28th the child walked a mile to Mr. Robertson's house. There was an ill-defined resistance over the cæcal region attended with pain.

On May 1st the patient was worse, and all the symptoms of peritonitis were present.

From May 2nd to 13th he suffered from severe abdominal pain and distension; there was nausea but no vomiting; the bowels were moved two or three times; there was fever and rapid wasting. Abdominal section was performed on May 14th, and a large quantity of feculent pus escaped. The cavity was drained; flatus and fæces were observed in the discharge. He was quite well by the end of July.[1]

The next case is inserted because of its general bearing upon the way in which the subject of acute peritonitis has been considered in this paper.

22. Dr. E. Ceppi records a case in the 'Rev. méd. de la Suisse Rom.,' May 15th, 1887, of a woman, æt. 29, with chronic purulent peritonitis, which was cured by abdominal incision and drainage. The disease proved to be of gonorrhœal origin, small accumulations of Neisser's gonococci being found in the pus-cells. Similar microbes (diplococci, consisting of ovoid cells measuring 0·85 μ) were discovered also in the purulent discharge from the uterus.[2]

(3) Tubercular Peritonitis.

The formation of a quantity of peritoneal fluid has a very important bearing in one form of tubercular peritonitis. Progressive enlargement of the abdomen from increasing effusion is the chief clinical feature of these cases. Loss of flesh is not necessarily a very conspicuous symptom, and

[1] From the 'London Med. Record,' December 15th, 1887, p. 541.

[2] Ibid., p. 555.

loss of tissue weight may be disguised by the increase of weight from the ascitic fluid. These cases differ from those, in which after death the intestines are found firmly matted together, with caseous and softening masses and glandular enlargements interspersed amongst them, and also it may be difficult or impossible to find any trace in the firmly organised lymph of the grey tubercles, which are so marked a feature of the former variety. The course of the latter is more rapid, more acute, and more hopeless. It is marked by greater signs of abdominal mischief, subjective as well as objective, and by more serious constitutional symptoms. It may be that these different forms of tubercular peritonitis represent different stages of the disease; that the milder variety characterised by the grey tubercles and copious effusion marks the early stage, whilst the more rapid form, distinguished by universal adhesion and breaking-down caseous masses, constitute the later.

The virulence of the infection, and the vitality of the patient, very probably determine the variety of the disease. If the milder variety terminates favorably, it is possible that adhesions more or less general will be left; and in the more serious condition it is likely enough that the initial stage is one of effusion, but so short in duration, and so little pronounced, as frequently to escape observation.

If this be so—if tubercular peritonitis with abundant effusion, means either a milder or more chronic infection, or a greater resisting capacity of the patient, it is evident that this particular type of case will be more amenable to treatment, and offer greater facilities for permanent cure.

The physician strives in his treatment of these cases:

(1st) To improve the general health.

(2nd) To get rid of the fluid.

And it has generally been supposed that as the first object was attained, the fluid has gradually become absorbed. As the vitality of the individual makes headway against the attacks of the bacilli, the inflammatory condition diminishes, and absorption of fluid takes place more rapidly than it is secreted. This is doubtless true; but the writer desires to lay great stress upon this point, that the improvement of the general health is more rapidly and certainly attained when

the removal of the fluid is made the chief point in the treatment.

Last year he brought before the Clinical Society of London a number of facts which seemed to justify this conclusion, and they were confirmed by numerous cases obtained from German sources. It is found that the removal of this abundant effusion is usually followed by such a remarkable improvement in health as to lead to the opinion that the condition is to all appearance cured, and naturally some explanation of the fact is sought for.

The mechanical irritation during the operation producing some alteration in the character of the inflammation has been suggested, but it seems altogether inadequate, and is only adopted for want of a better theory.

The discovery of micro-organisms and the study of their habits and sequences has led to the application of ingenious theories, based on a considerable substratum of fact, to various forms of disease, whose pathology was previously but ill understood. The difficulty may possibly find its solution in connection with the germ theory.

Dr. Gairdner, in his interesting lectures on "Tabes Mesenterica,"[1] referring to the well-known case of Sir Spencer Wells, criticises thus:

"The singular importance of this case can scarcely be denied, whatever doubts may be entertained as to its true pathology. A sceptical inquirer, indisposed to admit the cure of tubercular peritonitis, will, of course, demur to accept an isolated case like this, in the absence of a thorough investigation as to the precise nature of the morbid deposit in the peritoneum; a follower of Koch would naturally demand at least one *instantia crucis*, wherein the tubercular bacillus shall have been shown to be present in the fluid."

There are two good reasons why we should not expect to find bacilli in the fluid:

1st. Their generally recognised habitat is in the tubercles themselves, and in some of the German cases I have alluded to, they were found there.

2nd. If the bacilli were a normal constituent of the fluid, which is so readily absorbed by the peritoneal lymphatics,

[1] 'Glasgow Med. Journ.,' p. 405, June, 1887.

the general infection of the body might be expected to be a necessary and rapid consequence of their presence, whereas the peritoneal disease may exist for a considerable time before disease appears in other parts of the body.

But if it is not expected to find the bacilli themselves in the effusion, it would be not unreasonable to expect to find in it some of those poisonous chemical substances which are the result of their existence in adjacent tissues. There would be nothing very remarkable if the fluid secreted into the peritoneum, and which surrounded and bathed the tubercles in its serous lining, was found to contain substances resulting from micro-organic growth going on within the tubercles.

And when it is remembered that these substances or ptomaines are excreted by the kidneys, and that where there is much effusion the quantity of urine is scanty, there is still less room for wonder that this watery fluid, which is secreted from the blood into the peritoneum, should contain these objectionable substances.

This then seems a reasonable interpretation of the facts. Slow poisoning by the gradual absorption and circulation of these alkaloid substances, in excess of the power of the body to eliminate them, explains the slow deterioration of health, waste of tissue, and inability of other organs to resist fresh inroads of the disease.

It offers, moreover, a ready explanation of the fact that the complete removal of the fluid is usually attended with such remarkably rapid and beneficial results. The absorption of these chemical poisons from the peritoneal fluid, combined with the circulation through the body of products of the bacilli that have never entered the effusion, constitute an aggregate too powerful for the powers of life to contend with successfully. The elimination of the first element in the combination so diminishes the adverse conditions against which the body is trying to make headway, that it seems as though it was enabled to pull itself together, and with renewed energy to cope with the disease and often completely to overcome it.

Hitherto attention has been paid to the important *rôle* which elimination of toxic matters from the body plays in

some cases of tubercular peritonitis, and of the high value of the evacuation of the effusion as a curative procedure, because the effusion collects and retains within the body substances antagonistic to life.

But, it will naturally be asked, how does this explanation apply to those cases which recover, but which do not appear at any time to have had any effusion? The writer recorded a case in the 'Lancet,' October 16th, 1886 (p. 718), which was also referred to in his paper at the Clinical Society. It was a case of complete intestinal obstruction due to matted intestines, and resulting from general tubercular peritonitis. At the laparotomy the peritoneum was covered with tubercles, and there were numerous enlarged, yellow, glandular masses. The patient was emaciated almost to a skeleton, and the outlook was regarded as hopeless.

But what happened? Slow but uninterrupted recovery; and the patient is now, three years after, a stout, healthy-looking woman, and possessing good health. There were two salient points in the progress of the case, and one of them bears closely upon the question under discussion.

Under the action of belladonna, the obstruction being in some manner overcome, the bowels began to act with great regularity and frequency. After the patient had been taking the drug for some time, the bowels were opened first once, then twice, and eventually as often as three or four times every day, the motions being soft and formed and of fair size; this went on for months, and even now, though the drug has been stopped for two years, the bowels still act with greater frequency than natural. There was no diarrhœa, but the intestinal contents were not allowed to tarry on their journey.

The ptomaines, which it is probable are excreted by the intestines, as well as by the kidneys, were not allowed the opportunity of being reabsorbed when once they had passed into the alimentary canal, but were rapidly removed from the body.

Another point which appeared to exercise a favorable influence, was the use for a prolonged period of digested milk. By this, the call made upon the powers of the patient for the digestion and assimilation of food was

reduced to a minimum, and as the result of the improved nutrition and the diminished expenditure of vital energy in that direction the struggle of the body against the disease was carried on with increased vigour and marvellous success.

This case suggests very strongly that the deleterious products of tubercular micro-organic life may be removed from the body by the natural excretory channels.

In those cases which recover or greatly improve, it seems likely that the intestinal tract plays an important part in this elimination ; and it may be that the attacks of diarrhœa, which are sometimes seen in tubercular peritonitis, are not necessarily dependent upon ulceration of intestine, but are really natural attempts on the part of the body to relieve itself of toxic substances.

The clinical and pathological resemblances that these three different conditions possess, have induced the writer to consider them together.

The practical bearing of what has been said is obvious, but he has abstained from entering into a discussion on details of operative procedure, from a fear of adding to the length and not to the interest of this paper ; and indeed such points are better left to those of riper experience, who are more competent to express opinions on such matters.

Abstracts of recorded cases illustrating the cure of tubercular peritonitis by removal of the effusion.

23. Related by Sir Spencer Wells.[1] An exploratory incision was made in 1862 upon a lady, æt. 22, who was suffering from an uncertain abdominal condition. The peritoneum was found studded with myriads of tubercles. A large quantity of opalescent fluid escaped. The patient got well and married, and when heard of, in 1884, was in good health.

24. Recorded by Dr. John Homans, Boston.[2] Laparotomy was performed on a girl, æt. 21, suffering from tubercular peritonitis with ascites. There were deposits of tubercle on all

[1] 'Abdominal Tumours,' p. 20. [2] '384 Laparotomies,' p. 42.

the abdominal contents seen. The wound healed by first intention, but opened spontaneously on the eighteenth day, and gave exit to much clear serum. She went home July 12th, 1884.

Catamenia absent since February, 1884, returned in January, 1885, and have been regular since. She became fat and strong—gained 30 lbs. in weight—was married in June, 1885. Last seen, November, 1886, strong and well; a sinus still remained, discharging a drachm of pus daily.

25. Recorded by the writer.[1] A girl æt. 16, fairly nourished, was operated upon on July 7th, 1886, for what was supposed to be an ovarian cyst. The condition proved to be tubercular peritonitis. The ascitic fluid was removed, and the abdomen washed out. She made a good recovery, and put on flesh rapidly. Her weight was 7 st. when she left the hospital, and 8 st. 4 lb. on March 4th, 1887. Being unfortunately circumstanced, her health deteriorated in August, 1887, but when last seen on August 28th, 1888, she was fat and in good health, and some slight chest signs that had been present in October, 1887, had disappeared.

26. Recorded by Dr. T. Kilner Clarke.[2] A girl, æt. 13, was admitted to hospital suffering from tubercular peritonitis with effusion. On May 16th, 1887, laparotomy was performed, and the abdomen washed out with a 1 per cent. solution of carbolic acid. The case did uninterruptedly well. On June 5th weight was 5 st. 2 lbs., and after three weeks at a convalescent home it increased 9 lbs.

On July 6th she was altered beyond recognition, being a plump, rosy-cheeked girl, and able to walk a long distance. The improvement in the pulse, the temperature, and the quantity of urine secreted, produced by the operation, was well shown by a Table. The evening temperature fell from 100·6° to below 99°, the pulse from 120 to 100 (last observation). The quantity of urine passed daily rose gradually from 675 cc., with a sp. gr. of 1020, to 1000 cc., with a sp. gr. of 1030.

[1] 'Clin. Soc. Trans.,' vol. xxi, 1888.

[2] Ibid.

Cases bearing upon the question of the elimination of toxic substances from the body in tubercular peritonitis.

27. A case in which no effusion existed, but in which laparotomy was performed, has been related above at considerable length.

The explanation that the writer suggests there receives some support from the following cases, which are often met with in practice.

28. Case of a boy, æt. 13, who died from the results of tubercular peritonitis. At the necropsy the following condition was found in the abdomen:

"The stomach and intestines *were universally adherent.* The omentum, destitute of fat, was like a false membrane spread over them. Behind the stomach was a collection of thin purulent fluid. In the right iliac, inguinal, and suprapubic regions was a large cavity with ragged walls filled with fæcal and purulent fluid. On emptying this an opening was found, leading into what was thought to be the cæcum at the bottom of the cavity. This portion of the bowel was incorporated in the wall of the cavity by adhesions, and the opening, whose edges were somewhat thickened, was large enough to admit a finger. It was probably the result of a perforation of a tubercular ulcer."

Caseating tubercles in liver capsule. Miliary tubercles in the lungs.

29. *Case of tubercular peritonitis; obstruction of the bowels; death.*—Boy, æt. 18. Illness began in April, 1888, with constipation and some abdominal uneasiness. On May 15th tubercular peritonitis was diagnosed, constipation being the feature leading to advice being sought. He was placed upon belladonna pills (gr. $\frac{1}{4}$) with satisfactory results. In June he had complete obstruction for ten days, and the writer at that time had the opportunity of seeing him in consultation with Drs. Taylor and Godfrey, of Scarborough, under whose care he then was. By careful treatment the obstruction diminished, and the bowels were opened several times, but he went steadily downhill, and death took place on June 30th. Through the kindness of Dr. Godfrey the

writer is able to add the following details :—On the day of his death he was seized with severe pain in the abdomen at 6 a.m., lasting for an hour, and then passed a huge amount of fæces, semi-solid and fluid (two bed-pans full). When Dr. Godfrey saw him he was fearfully collapsed and evidently dying.

Necropsy.—The intestines generally were so matted that it was quite impossible to separate them except by long and careful dissection. At one point in the right iliac fossa the lower part of the ileum was bound tightly down, and almost occluded by a very strong band which ran from that point right across the abdomen to be attached to the abdominal wall on the left side. On the proximal side of this constriction the gut was distended with fæcal matter for some inches. Again on the left side another portion of the small intestine was almost completely occluded by a tense band of lymph, and above this constriction there was a small perforation with extravasation of fæces. This band was the chief cause of the block. There was a comparatively small amount of fluid in the peritoneum. The mesentery (or what could be distinguished of it) was studded with miliary tubercles, and the mesenteric glands were enlarged.

In both these cases the disease ran a very rapid course ; in both the condition of the abdominal contents was such that great impediment was offered to the free passage and evacuation of the intestinal contents, and consequently to the elimination of ptomaines by this channel.

The immediate result of the perforation in the second case, viz. the restoration of a free passage through the bowels by relief of the distension above the constriction, suggests that elimination of ptomaines by the bowel is the explanation of the following remarkable fact, which was related to the writer by a friend in whose practice it occurred :—A fæcal fistula occurred in a case of tubercular peritonitis, in which obstruction had at one time been present. Free discharge took place from the fistula, but from that time the patient made good progress towards recovery, and the fistula gradually diminished.

LIST OF SPECIMENS ADDED TO THE PATHOLOGICAL MUSEUM

DURING THE YEARS 1886-88.

By G. NEWTON PITT, M.D.

The numerous additions which have been made to the Museum during the last thirty years by successive Curators have crowded our shelves and made our catalogue cumbersome. It was therefore decided last year that a new catalogue should be issued, in which the description of the specimens and the clinical history of the patients should be given more fully than in the edition of 1860. Many specimens require remounting, others which are defective can be replaced by more typical examples, and a large number of the tumours still lack microscopical examination; while some lesions are represented by an excess of specimens, others, by no means rare, are still unrepresented. It is also desirable, in order that we may repair our deficiencies, that a list should be compiled of the specimens of which we are in want. For these purposes a committee was formed, the surgical section of which has already examined and remounted the very fine series of bladder tumours we possess, and is selecting a number of specimens, illustrating the more common forms of disease, which will constitute a student's educational section.

Eighty-six new preparations have been added to the Museum and, following the example of my predecessor, Dr.

Goodhart, to whom we are much indebted for valuable advice and assistance, I propose drawing attention to those of special interest.

1260[19] is an excellent example of spiral fracture of a tibia, contributed by Mr. Poland.

1396[73] is a remarkable specimen of gumma of the heart, which led to an aneurysm, and ultimately to rupture of the heart; the other cardiac specimen, 1396[26], is an aneurysmal pouching of the undefended space.

1577[20], a cholesteatoma of the brain, is a good example of this remarkable condition, contributed by Dr. Price.

1682[100], a calcareous mass which Surgeon-Major Bovill crushed and removed from the nostril of a Hindu, is the only specimen of a rhinolith we possess.

1696 [20 & 21], showing deep and extensive ulceration of the larynx and fauces in very young children, represent a condition which is undescribed in books. One of the cases was supposed to have followed diphtheria.

1709[11], a thrombus attached to an atheromatous patch on the aorta, occurred in a very feeble patient with stricture of the œsophagus.

1717[12 & 13] contain foreign bodies in the right bronchus, and in both cases the symptoms during life were not very characteristic.

1718[44] illustrates the cystic condition of the bronchi, associated with adhesion of the pleura, of which several examples have been mounted by Dr. Goodhart in recent years.

1789[22] is an unusual example of compression necrosis, the œsophagus having ulcerated from the pressure of the cricoid cartilage against the vertebræ in a case of cerebro-spinal meningitis, where the head was persistently retracted.

1792[52], an œsophagus with a catheter through a cancerous stricture, is the first case in which Mr. Symonds used this method of treatment, and with most satisfactory results, as the patient lived eight months in comparative comfort.

1793[28] is a most unusually dilated œsophagus, of which, unfortunately, there is no clinical history.

1817[70], a duodenum infested with *Ankylostoma duodenale*, is one of Dr. Beaven Rake's contributions to the Museum.

1854[72] is a very unusual condition of sacculation of the

colon caused by chronic peritonitis, which ultimately ended in perforation with a local abscess.

1906[93], a patent umbilical vein which carried on the portal circulation in a case of cirrhosis of the liver, supplies a deficiency in the Museum.

1883[10], a stricture of the rectum associated with ectopia vesicæ, is of interest in connection with 1882[60], a rectum opening into the neck of the bladder.

The interest of 2300[25] is mainly clinical, it being the twentieth recurrence of a fibro-sarcoma of the breast.

2261[70] is a very rare condition of tubercular disease of the mucous membrane of the uterus, which is hitherto unrepresented in the Museum. During life it was considered to be a case of malignant disease.

Mr. Bryant's specimens of cured popliteal aneurysms show, in the case which was cured by digital compression, a patent femoral artery with the vessel adjacent to the aneurysm filled with clot; and in the case where the artery was ligatured the vessel near the aneurysm is patent, which support the views of Mr. Savory, published in the 'Trans. Roy. Med.-Chir. Soc.' for 1887.

The work of preparing and describing the majority of the specimens has fallen on the sub-Curator of the museum, Mr. J. H. Targett; while the duty of mounting the new specimens and remounting many of the old, together with much histological work, has devolved on his assistant, Henry Hunt. The Museum Superintendent, Mr. Betts, has as usual devoted his time to keeping the old specimens in good condition. The year's work may be viewed with satisfaction by all.

[*M.R.* stands for Medical Report. *S.R.* stands for Surgical Report.]

1054[35] Fractures of First Ribs ... ... Mr. LANE.

The upper specimen shows a fracture an inch and a quarter outside its tubercle, which is firmly united by bone. In the middle specimen the fracture is ununited, and a false joint has developed. The lowest specimen was broken through the costal cartilage, about one eighth of an inch

from its outer extremity, and callus extends outwards over the rib. They all occurred on the right side, without fracture of other ribs.

See Path. Trans., vol. xxxvi, p. 327.

1077[55] Necrosis of Skull ... ... Mr. DURHAM.

The specimen consists of 42 fragments of necrosed bone removed from the frontal and parietal regions. In a few instances the fragments comprise the entire thickness of the skull, but the majority are outer table only. The under surfaces of the latter have the characteristic worm-eaten appearance.

William C., 48; illness began with a "boil" on the forehead. Four years later these fragments were removed by two operations at an interval of five months. No history of syphilis. Death from lardaceous disease. *See S. R.*, Mr. DURHAM, No. 136, 1877.

1081[55] Sarcomata of the Skull ... ... Mr. HOWSE.

A calvarium of an infant showing a large tumour in the left frontal region, which projects on both surfaces of the bone. It is nearly spherical in outline, measuring three inches in diameter. The dura mater and pericranium are tightly stretched over the tumour but not invaded by it. The area of bone covered by the growth is partially absorbed in the centre. A small secondary deposit is seen in the left parietal region near the middle line. At the back of the specimen a portion of rib is shown in which the bone has been entirely replaced by growth. Histologically the tumour is a very vascular, round-celled sarcoma.

Edgar G., 1; admitted with a swelling on the forehead of two months' duration. He died of broncho-pneumonia three weeks later. There were no brain symptoms. Secondary deposits were found in the liver, ribs, and abdominal glands. *See Insp.*, No. 78, 1886.

1082[75] Bullet lodged in Base of Skull ... ... Mr. BRYANT.

The bullet is embedded in the left posterior clinoid process, having completely severed the left optic nerve. Its track passed through the left frontal and ethmoidal sinuses, which were filled with gelatinous pus.

Gerald M., 19; attempted suicide by firing a pistol at his forehead. The wound never closed, there were occasional epileptiform seizures, and he died comatose about nine months after the injury. Post-mortem.—There was chronic meningitis and a large abscess in the right frontal lobe. *See Lancet*, vol. i, 1886, p. 971.

1091[1] Necrosis of Jaw from Phosphorus ... Mr. SYMONDS.

An abundant spongy periosteal deposit, characteristic of this disease, is seen on several parts of the specimen; especially on the fragment suspended at the side of the bottle.

Thomas W., 30; worked as "dipper" in a match manufactory for thirteen years. There was a history of swelling of the jaw of six months' duration, which was followed by abscess and sinuses. The portion of the lower jaw seen in the specimen was removed, and a year afterwards the man was in active work. *See S. R.*, Mr. SYMONDS, No. 58, 1884.

1091[10] Necrosis of Lower Jaw ... ... Mr. DURHAM.

The largest fragment comprises the entire thickness of the anterior half of the lower jaw. The left ascending ramus has been removed as high as the sigmoid notch.

Sarah R., 34; illness began a year and a half ago with pain in face and a swelling over jaw, which suppurated and formed several sinuses. All the fragments exhibited were removed at one operation. The patient was seen five years later in good health. *See S. R.*, Mr. DURHAM, No. 149, 1876.

1091[32] Cystic Sarcoma of Lower Jaw ... Mr. DAVIES-COLLEY.

Portion of right lower jaw invaded by new growth, chiefly at the angle. The outer surface is bossy from the protrusion of numerous cysts, which are smooth-walled and partly covered by a bony capsule. The internal surface shows infiltration of the muscles by solid growth, while on longitudinal section the bone is seen to be completely replaced by growth and cysts of various sizes. Microscopically the tumour consists of rounded masses or branching columns of cells, embedded in an abundant fibrous stroma. The cells are principally round or oval, but at the periphery of the masses they are often cubical. The cysts are formed by mucoid degeneration of the central cells. This variety of growth has been called cystic epithelioma.

Sarah P., 53; first noticed a swelling on the jaw a year and a half ago, which has grown slowly. *See S. R.*, Mr. DAVIES-COLLEY, No. 85, 1887.

1097[90] United Fracture of Neck of Scapula ... Mr. LANE.

The line of fracture has passed through the surgical neck of the scapula, and there is slight downward displacement of the outer fragment.

See Guy's Hosp. Rep., vol. xliii, p. 415.

1124[50] Enchondromata of Finger ... ... Mr. LUCAS.

The metacarpal bone and phalanges of forefinger affected with cartilaginous new growths, which are seen on section to project from the interior of the bones. The earliest stage is well shown in the second phalanx, where the tumour has produced no external enlargement. They are semi-translucent in appearance, and composed of hyaline cartilage with small angular cells.

Thomas M., 18; the tumours had been growing on his finger as long as he could remember. *See S. R.*, Mr. LUCAS, No. 25, 1887.

1157[50] Necrosis of Upper End of Femur ... ... Mr. BRYANT.

The specimen consists of the head, neck, and upper third of a right femur, with the epiphysis of the great trochanter. These portions were removed for necrosis the result of acute ostitis, with secondary disorganisation of the hip-joint. At the operation the head of the femur was quite bare, and lying loose in the acetabulum; the neck and diaphysis were also exposed, with little or no sign of repair. Five months later, however, there appeared to be very complete reconstruction of this portion of the bone, and it moved freely on the pelvis. The limb was one inch shorter than its fellow.

Flora S., 6; *see Lancet*, 1880, vol. ii, p. 853, and 1881, vol. i, p. 419.

1243[45] Central Necrosis of the Tibia. Mr. DAVIES-COLLEY.

A vertical section through the right tibia and ankle-joint, showing a central necrosis of the tibia. The sequestrum occupies the lower half of the medullary canal; it is white and spongy, the spaces being filled with caseous material. It is quite loose, except for the last inch, which is still attached to the lower extremity of the tibia. The compact tissue of the shaft of the bone is thickened and sclerosed. There is disorganisation of the ankle-joint by suppuration, and it will be observed that the projecting lower end of the sequestrum has worn a depression in the softened tissues of the astragalus.

William S., 71; there was a history of an old accident to the right leg followed by lameness. During the last five months he has had pain down the calf, and about two months ago the ankle began to inflame, and sinuses formed around it. There was complete obliteration of the anterior tibial artery by thrombosis, but the dorsalis pedis and posterior tibial were patent, though very atheromatous. *See S. R.*, Mr. DAVIES-COLLEY, No. 187, 1887.

1260[19] Spiral Fracture of Tibia ... ... Mr. POLAND.

The line of fracture commences five inches from the lower extremity of the left tibia on the posterior surface, and, after making a complete circuit of the bone from left to right, terminates in the ankle-joint as a long transverse fissure. The upper end of the corresponding fibula was similarly broken, but the fragments were more comminuted.

William F., 35; whilst drunk he slipped in walking on the edge of the pavement and fell. There was much contusion of the leg, and the upper fragment of the tibia projected on the inner side, but was readily replaced. Death occurred on the tenth day from laceration of the brain and pneumonia.

1272[10] Green-stick Fracture of Fibula. Mr. DAVIES-COLLEY.

The upper end of right fibula, showing an incomplete fracture, which occurred in association with a separation of the upper epiphysis of the corresponding tibia.

George S, 8; he fell off a hearse and a wheel passed over his right knee. *See S. R.*, Mr. DAVIES-COLLEY, No. 329, 1886.

1284[25] Stump after Lisfranc's Amputation. Mr. GOLDING-BIRD.

Amputation had been performed eight years previously for gangrene of toes. The stump had hardly been used for walking, but pressure on it could at all times be borne perfectly.

Arthur J., 52; *see S. R.*, Mr. GOLDING-BIRD, No. 6, 1887.

1344[60] Loose Body from Knee-joint ... Mr. DAVIES-COLLEY.

It somewhat resembles a patella in outline, the anterior surface being convex and nodulated, while the posterior is smooth and slightly concave. This is due to its formation on the front of the condyles of the femur. It consists almost entirely of true bone with a thin superficial layer of ossifying cartilage.

Thomas A., 59; had a loose body in left knee-joint twenty years ago, which was fixed by operation. The present specimen was recently discovered after a slight strain of the same knee. There were well-marked symptoms of osteo-arthritis. *See S. R.*, Mr. DAVIES-COLLEY, No. 218, 1887.

1361[55] Sloughing of Deep Muscles of Leg.
Mr. DAVIES-COLLEY.

Resulted from thrombosis of posterior tibial and peroneal arteries, which were filled with adherent clot from their origin to within two inches of the ankle. In middle third of leg they were not recognisable as they passed through the sloughy tissues. Anterior tibial and plantar vessels normal, and skin of leg not gangrenous.

Cornelius Q., 26; admitted for syphilitic necrosis of femur. Five weeks before death great swelling and tenderness of calf of leg, with deep suppuration. Died of lardaceous disease. *See S. R.*, Mr. DAVIES-COLLEY, No. 148, 1882.

1369[15] Pork affected with Trichina Spiralis ... ... Dr. PRICE.

The muscular fibres are separated by rows of encysted trichinæ in their larval form, some of which have fallen out and are seen at the bottom of the bottle.

1376[37] Bony Tumour of Buttock ... ... Mr. BRYANT.

The specimen consists of one half of the tumour seen on vertical section. It is composed of a number of separate rounded masses of true bone embedded in fibro-fatty tissue, many of which have a distinct border of hyaline cartilage. Some fibres of the gluteus maximus are attached to the under surface of the tumour.

George E., 23; has worked for many years as an iron ship-builder, usually in a sitting position. The tumour was first noticed four years ago over the left tuber ischii, and grew very slowly. *See S. R.*, Mr. BRYANT, No. 27, 1887.

1396[26] Aneurysm of the Undefended Space ... Dr. TAYLOR,

At the upper part of the septum ventriculorum the undefended space is bulged out towards the right ventricle. forming a globular sac large enough to admit the tip of a middle finger. The interior is perfectly smooth, and the wall is thin and transparent. On the right side of the heart the aneurysm bulges both into the right ventricle and the right auricle, the septal cusp of the tricuspid valve being attached to it. There is no communication with the right side. The endocardium around is smooth and healthy, the aneurysm being congenital in origin.

Henry H., 55; admitted in a dull helpless condition with a soft apex systolic murmur. He died a fortnight later of meningeal hæmorrhage, the aneurysm not having caused any symptoms. *See Trans. Path. Soc.*, vol. xxxvii, p. 152.

1396[73] Aneurysm of Heart due to a Gumma ... Dr. GOODHART.

The posterior surface of a heart, showing a diffuse gummatous growth in the wall of the left ventricle near the apex. A window has been cut in the left ventricle, and white fibroid material is seen extending from the wall into the musculi papillares. Projecting posteriorly from the apex is an ellipsoidal aneurysm, two and a quarter inches long by one and a half across, which communicates with the left ventricle by an opening the size of a sixpence. Its wall is thin and smooth, and the ruptured portion, which was the

cause of death, has been cut away to display the interior. On the anterior surface of the heart (at the back of the specimen) the gumma is seen on section, presenting an irregular fibroid structure, with the remnants of an old hæmorrhage into its substance in the form of small granules of dark brown pigment.

From a man, æt. 30. *See Trans. Path. Soc.*, vol. xxxviii, p. 102.

1450[58] Aneurysm of Pulmonary Artery ... Dr. GOODHART.

A portion of lung, showing a cavity the size of a walnut, into one corner of which an aneurysm, three eighths of an inch across, has ruptured. It is situated on one of the larger branches of the pulmonary artery, an adjacent branch being indicated by a red rod.

Arthur C., 23; had been ill with phthisis for seven months. His first attack of hæmoptysis was four days before death, and the third proved fatal in three minutes. *See Insp.*, No. 178, 1887.

1501[24] Ante-mortem Clot on the Aorta. Mr. DAVIES-COLLEY.

A small blood-clot, the size of a filbert, adherent to a slightly atheromatous patch on the aorta, just above the pillars of the diaphragm. In the recent state it was laminated and partly decolourised.

Thomas P., 66; admitted with epithelioma of the œsophagus, in a very emaciated condition. *See Insp.*, No. 95, 1888.

1519[36A] Cured Double Popliteal Aneurysm ... Mr. BRYANT.

The specimen includes the whole length of the vessels, from the bifurcation of the aorta to the aneurysmal sacs. On the right side the femoral has been ligatured two inches and a half below the origin of the profunda, and clot is seen extending downwards for four inches. Below this the vessel is pervious for two inches and a half, but is again blocked for an inch above the mouth of the aneurysm. The vessel on the opposite side is blocked for three inches above the sac. The walls of the aneurysms are thick and fibrous, and

their cavities much contracted. Patches of atheroma are seen near the mouths of the profunda branches.

From a case in which one aneurysm was cured by pressure, and the other by ligature, many years before death.

1527[45] Varix of the Saphena Vein ... ... Mr. BRYANT.

A globular swelling situated on the left internal saphenous vein an inch and a half below the saphenous opening.

From Elizabeth W., 24; has varicose veins lower down the same leg.

1542[20] Lympho-sarcoma of the Neck ... ... Mr. DURHAM.

A tumour removed from the right side of the neck, to which are attached several enlarged glands. Its outer surface is very lobulated, and has the appearance of a number of enlarged glands bound together by tough fibrous tissue. Microscopically it has the typical characters of a lympho-sarcoma.

Richard M., 8; swelling in neck began fourteen months ago, but has only grown rapidly during the last month. It caused a severe attack of dyspnœa, for which it was removed. A year later it had recurred to an enormous extent on both sides of the neck. The glands in other parts of the body were not enlarged. *See S. R.*, Mr. DURHAM, No. 28, 1881.

1577[20] Cholesteatoma of Base of Brain. Dr. PARRY PRICE.

A tumour is seen extending from the bulb to the optic chiasma, and pushing aside the temporo-sphenoidal lobes. The irregular nodular mass on the left of the pons has the characteristic mother-of-pearl lustre, while the large mass on the opposite side has protruded into the brain, and appears on horizontal section outside the ganglia of the right lateral ventricle. It is everywhere separated by membrane, continuous with the pia arachnoid, from the brain-substance. Microscopically it showed an abundance of cholesterin, with old cells devoid of nuclei and a few dark granular masses.

From a woman, aged 39, who had suffered from epileptiform seizures for five years. These gradually became worse, she lost the sight of the

right eye, and one morning was found dead in her bed. *See Path. Trans.*, vol. xxxviii, p. 24.

1602[34] Fibro-sarcoma of Dura Mater ... ... Dr. TAYLOR.

The tumour was growing on the inner surface of the dura mater of the right middle fossa, and had caused softening of the adjacent cerebral tissue to which it was adherent. The bone was unaffected. The tumour measures two inches by one and a quarter; it is firm, with a white fibroid centre, but a less dense periphery. Microscopically it consists chiefly of fibrous tissue, with numerous vascular lacunæ, but the margin of the section is composed of sarcomatous tissue of the round-cell type.

Elizabeth B., 28; died of granular kidneys. For the last two years she had been suffering from occipital headaches and transient attacks of blindness, but the existence of the tumour was unsuspected. *See Insp.*, No. 42, 1887.

1603[42] Psammoma ... ... Mr. DUNN.

A large spherical tumour covered with pia mater and adherent to the dura mater, which it has perforated. The bone was slightly eroded at this spot. It had caused a very considerable indentation of the brain at the upper part of the right parietal region, but was not adherent to the cerebral tissue. Microscopically it consists of dense fibrous tissue, in which are embedded many calcareous concentric bodies.

From an elderly male subject in the dissecting room. On inquiry no history of paralysis or special nervous symptoms could be obtained.

1615[5] Crushed Plantar Nerve causing Tetanus.
Mr. GOLDING-BIRD.

Portion of left foot showing a crush-fracture of terminal phalanx of great toe, and the internal plantar nerve passing through the contused soft tissues.

George W., 43; a piece of iron fell on his foot, wounding the great toe. Admitted a week after the accident with symptoms of tetanus and commencing gangrene. Amputation. Complete recovery. *See S. R.*, Mr. GOLDING-BIRD, No. 83, 1886.

1620[12] Myxo-sarcoma on Sciatic Nerve. ... Mr. SYMONDS.

A half-section of a tumour the size of a cocoa-nut, to which is adherent a large portion of the sciatic and popliteal nerves. The convex surface of the tumour is lobulated and covered with a thin distinct capsule. On section it has the streaky appearance of a dense fibrous tumour, but in reality is comparatively soft and elastic. The sciatic nerve at its bifurcation, and two inches of the adjacent external popliteal nerve, are inseparably connected with the new growth. Microscopically it consists of a delicate homogeneous matrix in which small round cells are closely embedded. The nerve shows invasion by growth between the bundles.

Sarah S., 33; in Feb., 1886, a small swelling appeared on the back of the lower third of the right thigh, which caused shooting pains down the limb. Six months later the tumour was removed, but speedily recurred, and a year after its first appearance it was found necessary to amputate the thigh. A small nodule was removed from the stump a few months afterwards, but in Jan., 1888, the patient was quite well, and there were no signs of a return of the disease. *See S. R.*, Mr. SYMONDS, No. 27, 1887.

1636[27] Rodent Ulcer of the Face ... ... Mr. SYMONDS.

The specimen includes the whole ulcer, with the adjacent healthy skin. It is oval, an inch and a half in its long diameter, and has a remarkably sinuous, rolled edge of a yellowish colour. The centre is much depressed. In the lower corner, to the left hand, is a small portion of a similar ulcer, which is entirely separated from the main ulcer by a narrow strip of healthy skin. Histologically, it consists of columns of small epithelial cells, but there are no "bird-nests."

Margaret T., 58; four years ago a dry flat "wart" appeared on left cheek near the ala nasi, and a year later a similar one was noticed at the root of the nose. They both slowly enlarged, and, on admission, they had invaded nearly the whole surface of the nose, though still separate from one another. There were no enlarged glands. *See S. R.*, Mr. SYMONDS, No. 19, 1887.

1643[60] Dermoid Cyst of Thigh ... ... Mr. GOLDING-BIRD.

A multilocular cystic tumour removed from the outer side of right thigh just above the knee-joint. The wall is

composed of true skin having a well-marked papillary layer, and a much thickened epidermis, to which the yellow colour of the interior is due. The loculi were filled with yellow sebaceous material.

Louisa F., 38; the tumour had grown slowly for fourteen years, but had caused no inconvenience. It was superficial to the deep fascia, though adherent to it. *See S. R.*, Mr. GOLDING-BIRD, No. 25, 1882.

1649[87] Nævus of Tongue ... ... Mr. JACOBSON.

A portion of the left half of the tongue inverted. It shows a large nævus, about an inch long, situated chiefly on the under surface of the tongue, and an inch from the tip. It is rendered solid by coagulation of blood, but the fibrous septa making up its cavernous structure are well seen.

Ellen W., 28; a swelling on the tongue was first noticed when three years of age, and it has been gradually enlarging ever since. *See S. R.*, Mr. JACOBSON, No. 17, 1886.

1650[24] Papilloma of Hand ... ... Mr. DURHAM.

A large hemispherical tumour two inches in diameter, situated on the dorsum of the right hand. The surface is papillary, and covered in some spots with black scabs; the edges are overhanging, and it is attached to the skin by a constricted base. On section the elongated papillæ are well seen, and between some of them yellow streaks of retained epidermic scales are visible.

Richard P., 68; the tumour had been growing for three years. There were no enlarged glands. *See S. R.*, Mr. DURHAM, No. 91, 1876.

1652[38] Congenital Coccygeal Tumour ... ... Mr. BRYANT.

An irregular, multilocular, cystic tumour, situated between the coccyx and rectum. An arch of bone is embedded in the tough fibrous tissue which surrounds the cysts. The loculi contained sebaceous material, and were lined with columnar epithelium.

John B., 19; admitted with discharging sinus between the buttocks, over the coccyx, which had existed since childhood. On exploration the tumour was discovered and removed. *See S. R.*, Mr. BRYANT, No. 62, 1886.

1652[45] Concretion from a Lipoma ... ... Dr. CORNWALL.

Found embedded in a fatty tumour on left chest. It weighs 105 grains, and is composed chiefly of cholesterin.

1652[57] Lipoma of the Hand ... ... Mr. BRYANT.

A flattened mass of adipose tissue, situated in the palm of the hand, and extending between some of the fingers to the dorsum. It was bound down by the palmar fascia, and formed a layer beneath the flexor tendons. The tumour is markedly lobulated. Many of these rounded lobules were very freely movable, simulating a diffuse palmar ganglion.

David R., 49; the swelling began seven years ago. It was removed, and the patient made a good recovery. *See S. R.*, Mr. BRYANT, No. 30, 1883.

1656[18] Lymphangeioma of Skin ... ... Mr. BRYANT.

Three portions of skin removed from the surface of a degenerated congenital nævus of the axilla. They show a bunch of small pedunculated cystic tumours filled with clear serous fluid, which consist of dilatations of the lymphatic channels. The subcutaneous tissue contains similar spaces embedded in a dense fibrous stroma.

Francis T., 26; he was first seen, at the age of five months, with a very large congenital nævus of left side of chest, which has since gradually withered. *See S. R.*, Mr. BRYANT, No. 31, 1887.

1661[60] Melanotic Tumour of the Chest. Mr. DAVIES-COLLEY.

The specimen consists of a dark brown mushroom-shaped new growth, springing from the skin, having a constricted base and everted edges. A vertical section shows invasion of the whole thickness of the skin, and large ingrowths into the subcutaneous tissue. It was situated a

little below the right nipple. Histologically it is composed of long, narrow, alveolar spaces filled with large pigmented cells of a carcinomatous type.

Henry W., 50; the tumour began in a small black spot, attributed to the bite of a horse some twelve years previously, and has steadily increased during the last four years. The axillary glands were affected. A year later there was recurrence locally and in the axilla. *See S. R.*, Mr. DAVIES-COLLEY, No. 24, 1885.

1674[9] Epithelioma of Tongue ... ... Mr. HOWSE.

A portion of tongue injected, showing an epithelioma of its left border. The specimen has been divided, and the portions separated in order to show the new growth dipping down into the muscular tissue, from which it can be distinguished by its white colour. The surface is marked by a slightly raised, broad edge, and a central depression half an inch across. When recent, the dorsal surface of the tongue had the bald, white appearance of leucoma. The vascularity of the growing edge of the ulcer is well illustrated on section by the more deeply coloured zone of injection around it.

Ambrose N., 47; *see S. R.*, Mr. HOWSE, 1888.

1674[10] Epithelioma of Tongue ... ... Mr. SYMONDS.

There is a very large ulcerating epithelioma, which occupies the whole of the right half of the tongue. It measures two and three quarter inches long by one and a half across. Its edges are raised half an inch above the level of the tongue, and considerably everted. The surface of the new growth is shaggy from ulceration, which gives it a papillary appearance.

Sinball E., 65; eight months ago he first noticed a whitish hard pimple about the middle of the tongue. *See S. R.*, Mr. SYMONDS, No. 21, 1887.

1696[20] Severe Ulceration of Pharynx and Larynx ... Dr. PAVY.

There is extensive ulceration over the alæ of the thyroid, exposing a large part of the cartilage on the right side. On

this side also the ulceration has divided the aryteno-epiglottidean fold, and attacked the base of the epiglottis. The mucous membrane on the posterior surface of the arytenoid cartilages is swollen and œdematous.

Florence P., 3; admitted for diphtheria, with a history of three weeks' illness. Tracheotomy was performed, but she died four days later. It was supposed that the ulceration was secondary to the diphtheria. *See Insp.*, No. 50, 1886.

1696[21] Severe Ulceration of Larynx and Fauces ... Dr. TAYLOR.

The ulceration has destroyed both aryteno-epiglottidean folds and distorted the œsophagus. It has extended on either side to the alæ of the thyroid, and on the left side has affected the pillars of the fauces.

Harold H., 1½; had wheezing respiration and a paroxysmal cough for two weeks. Severe stomatitis developed and he died. *See Insp.*, No. 107, 1886.

1697[19] Stenosis of Trachea after Tracheotomy ... Mr. JACOBSON.

The trachea has been laid open from behind, and shows an irregular tracheotomy wound an inch and a quarter long, the edges of which are smooth and cicatricial. Below this the trachea is scarred and constricted, and its mucous membrane thrown into longitudinal ridges. It is also much compressed by large caseous bronchial and mediastinal glands.

John D., 18 months; tracheotomy was performed for dyspnœa caused by swallowing zinc chloride solution. He died of acute tuberculosis nearly fourteen months after the operation. *See M. R.*, vol. xcviii, No. 146A.

1709[10] Atrophy of the Posterior Crico-arytenoid Muscles. Dr. PYE-SMITH.

The wall of the œsophagus is infiltrated with an epithelioma a little above the bifurcation of the trachea, and both recurrent laryngeal nerves are compressed by the new growth. The posterior crico-arytenoid muscles are pale, wasted, and degenerated.

William H., 66; admitted with epithelioma of the œsophagus, aphonia, and bronchitis. He sank rapidly before a laryngoscopic examination had been made. *See Insp.*, No. 151, 1886.

1710[9] Piece of Meat Impacted in Larynx ... ... Dr. PITT.

A piece of meat, two inches and three quarters long, is lodged in the pharynx, and its smaller end is wedged into the larynx, which it completely occludes.

Edward W., 41; came out of an eating house and fell down, apparently in a fit. Was dead when brought to the hospital. *See Insp.*, No. 53, 1887.

1711[18] Hypertrophy of the Thyroid ... ... Mr. LUCAS.

A simple hypertrophy of the thyroid. This lobe was removed during life. It measures $5 \times 3 \times 2\frac{1}{2}$ inches.

1711[42] Thyroid in Myxœdema ... ... Dr. CARRINGTON.

The lateral lobes are small, but the pyramid is long and well developed. Microscopic examination showed complete atrophy of the glandular structure and substitution of fibrous tissue.

Arthur A., 41; admitted in a semicomatose condition, with the clinical symptoms of myxœdema, and died in a few hours. *See M. R.*, vol. xcviii, No. 45.

1717[12] Button impacted in Bronchus ... ... Mr. BRYANT.

The button has lodged at the first division of the right bronchus, where it has caused much ulceration and thickening of the mucous membrane. The section of lung shows thickening and dilatation of the smaller tubes.

Michael P., 49; he fell asleep whilst sucking a tin button, and awoke suddenly, gasping for breath. On admission, there was a good deal of coughing and expectoration, with diminished breath-sounds on left side. Operation was declined, and he died fifteen weeks later of pneumonia and bronchiectasis. *See S. R.*, Mr. BRYANT, No. 272, 1886.

1717[13] Pea in Bronchus; Bronchiectasis ... ... Dr. PAVY.

The pea is firmly wedged in the lower division of the right bronhcus. The upper lobe is healthy, but the re-

mainder of the right lung is densely fibroid, and riddled with smooth-walled intercommunicating cavities due to extreme dilatation of the bronchial tubes. The lung was compressed by an empyema, and lymph is seen on the pleura.

Joseph A., 3; illness began with cough two weeks ago, and during the last few days there has been frequent vomiting. Admitted with signs of pleuritic effusion on the right side, and meningitis. Died a month after onset of cough from empyema and cerebral abscesses. *See M. R.*, vol. xciv, No. 185.

1718[41] Hydatid of Lung ... ... Mr. JACOBSON.

There is a smooth-walled cavity in the right lower lobe, two inches in diameter, which communicates freely with the lower bronchus. No hydatid membrane was found lining it. The diaphragm was firmly adherent to the lung and the liver, but there was no hydatid in the adjacent hepatic tissue.

Louisa P., 23; there was a history of abdominal distension for five years. The liver, spleen, omentum, and retro-peritoneal tissues were crammed with hydatids. *See Insp.*, No. 397, 1885.

1718[44] Saccular Dilatation of Bronchial Tubes. Dr. GOODHART.

The left lower lobe of the lung is converted into a series of globular sacs with thin walls by dilatation of the bronchial tubes. These sacs communicate with one another by small sinuous passages. The main bronchus is healthy. There was a small patch of old pleuritic adhesions over the middle of the affected lobe.

Maria G., 22; admitted with bronchitis and pyrexia. She developed acute pneumonia on the right side and died, the condition of the left lung being unsuspected. *See Insp.*, No. 97, 1886.

1789[22] Ulceration of Œsophagus from persistent Retraction of the Head ... ... Dr. WHITE.

The mucous membrane over the lower part of the cricoid is completely destroyed, exposing an area of cartilage a quarter of an inch in diameter. There is a corresponding

ulcer on the posterior wall of the œsophagus, laying bare the muscular coat. These ulcers were due to the constant pressure of the cricoid cartilage against the spine.

Elizabeth H., 24; ill a fortnight before admission with pain in the back, vomiting, and retraction of the head nearly to a right angle with the trunk. Death from cerebro-spinal meningitis. *See M. R.*, vol. xcviii, No. 64; and *Trans. Path. Soc.*, vol. xxxviii, p. 14.

1789[80] Traumatic Stricture of Œsophagus; Gastrostomy.
Mr. DAVIES-COLLEY.

The œsophagus and stomach laid open from behind, and showing a stricture of the former for which gastrostomy has been performed. There is marked thickening and constriction of the œsophagus for about an inch and a half in length, the centre of which is opposite the bifurcation of the trachea. It barely admits a No. 6 catheter. The gastric fistula is only an inch and a half from the splenic extremity of the stomach.

Leonard W., 8; two years ago he swallowed some oxalic acid, and afterwards suffered from dysphagia and emaciation. Gastrostomy. Death fourteen months later from gangrene of right lung. *See S. R.*, Mr. DAVIES-COLLEY, No. 10, 1885.

1792[52] Œsophageal Catheter in situ ... ... Mr. SYMONDS.

There is an epitheliomatous stricture of the œsophagus, commencing four inches below the cricoid, and extending to within an inch of the stomach. The catheter passes the whole length of the stricture, and projects for about an inch into the stomach. There is no evidence whatever of ulceration above the new growth from the pressure of the tube.

James M., 40; he was kept alive for eight months in comparative comfort by means of these tubes, and eventually succumbed to gangrene of the lung. *See Trans. Clin. Soc.*, vol. xviii, p. 155.

1793[18] Extreme Dilatation and Ulceration of Œsophagus.
Dr. GOODHART.

The upper three inches are healthy, but below this the mucous membrane is extensively destroyed by many small

oval ulcers, and a few larger ones, from a third to half an inch in diameter. The muscular coat is exposed in many places. Just above the bifurcation of the trachea there is a raised button-like tumour a third of an inch across. The circumference of the œsophagus at its widest part is four inches, or more than double the normal size. The bronchial glands are much enlarged.

1805[50] Gall-stone ulcerating into Duodenum; Pyloric Obstruction ... ... Dr. PAVY.

A portion of liver, stomach, and duodenum, showing a fistulous communication between fundus of gall-bladder and duodenum indicated by a red rod. The fistula opens a little beyond the pylorus, which is much thickened and contracted by chronic inflammation around it. The cystic duct is blocked by a gall-stone, and the gall-bladder contains two or three small calculi.

Martha G., 52; admitted for progressive weakness, vomiting, and emaciation, with the clinical symptoms of pyloric obstruction, of which she gradually died. *See Insp.*, No. 22, 1885.

1817[10] Ankylostoma duodenale ... ... Dr. BEAVEN RAKE.

A portion of a duodenum, showing the worms mounted on pieces of black paper. They are found with their heads buried in the submucous coat, whence they are constantly sucking the blood. The females are 6—18 mm. long, and the males smaller, not exceeding 10 mm. in length. Their habitat in man is the upper part of the small intestine, where they pass their early developmental and their mature stage. The intermediate condition is spent in muddy waters. This parasite is common in Egypt and Brazil, and has been met with in India. It was the cause of considerable mortality among the workmen employed in the St. Gothard tunnel. When present in numbers they give rise to severe anæmia.

1854[72] **Sacculation of Colon ... ... Dr. GOODHART.**

The mucous surface for a length of five inches is much distorted, and presents many depressions elongated transversely and separated from one another by folds of mucous membrane. At the back of the specimen the sacculi appear as oval swellings, formed by a bulging of all the coats of the intestine. The apertures in many of them were made in preparation, with the exception probably of the lowest one, which has an edge of everted mucous membrane.

Caleb E., 60; for ten years had suffered with attacks of abdominal pain and constipation. Six weeks before death he had severe pain in the left side of the abdomen and symptoms of an abscess; and an ineffectual attempt was made to aspirate it. Post mortem, a large abscess was found between the spleen, left kidney, and colon. The bowel was puckered up into folds by old peritonitis, and the abscess was due to perforation, probably at the spot indicated above.

1872 Follicular Ulceration of Colon ... ... Dr. PAVY.

Two portions of large intestine, showing a great number of small punched-out ulcers, giving it a honeycombed appearance. In many of them the central slough remains. The portion at the back of the specimen was removed from the cæcum, and shows the earliest stage, consisting of a general swelling of the solitary follicles.

Patrick K., 33; admitted for abdominal pain and persistent diarrhœa, of which he died. Post mortem.—A carcinoma of the rectum was discovered causing great distension and ulceration of the colon. *See Insp.*, No. 336, 1884.

1882[60] **Imperforate Rectum; Recto-urethral Fistula.**
Mr. LUCAS.

A vertical section through penis, bladder, and rectum, showing the termination of the rectum in the prostatic urethra. The opening is situated in the centre of the verumontanum, which forms a ridge on either side of it. The wall of the bladder is somewhat thickened.

Frank G., 9 months; he was operated on for imperforate rectum three days after birth. A fortnight later the wound closed, and fæces and

wind passed by the urethra. Gradually sank. Post mortem.—Left kidney very small and shrunken, its ureter being entirely occluded at the lower end. There was intense cystitis, and six small dark brown calculi in the bladder, evidently of fæcal origin. *See Insp.*, No. 284, 1884.

1883[10] Congenital Stricture of Rectum ... ... Mr. BRYANT.

The lower extremity of the rectum and anus, showing a congenital stricture about an inch from the latter. The stricture is caused by a kind of diaphragm resulting from the incomplete coalescence of the hind-gut and proctodæum of the fœtus. This condition has been styled "hymen of the rectum."

From the same case as No. 2083[15].

1906[93] Persistent Umbilical Vein ... ... Dr. TAYLOR.

The umbilical vein, which is a vessel a quarter of an inch in diameter, has been injected with red lead, and communicates freely with the portal vein, which is indicated by a blue rod. There is marked "hobnail" cirrhosis of the liver.

Thomas E., 53; a hard drinker, who was admitted for hæmatemesis, of which he had also had an attack ten years previously. There was no ascites, the circulation having been carried on by the patent vein. *See Insp.*, No. 416, 1884.

1921[53] Primary Scirrhus of the Liver ... ... Dr. PITT.

A section of a liver, weighing 120 ounces, the right lobe of which is extensively infiltrated with a carcinoma, which has originated in it. The greater portion of the new growth consists of fibrous tissue in which are embedded spheroidal cells arranged in tubes and columns.

Alfred W., 48; admitted with pain in right side and swelling of abdomen. He gradually became paraplegic, and died of bronchitis. Post mortem, there were secondary growths in the spine, lungs, spleen, kidneys, and glands. *See Trans. Path. Soc.*, vol. xxxviii, p. 151.

1967[10] Biliary Calculi ... ... Dr. TAYLOR.

Fifteen irregular nodular black calculi removed from gall-bladder. They consist mainly of bile-pigment.

Thomas F., 60; died of chronic bronchitis and dilated heart. *See Insp.*, No. 39, 1887.

1986[76] Gall-stone causing Intestinal Obstruction. Dr. PYE-SMITH.

A long oval calculus having a dark friable amorphous nucleus, with a thick zone of radiating cholesterin crystals, and a more or less complete outer coating of pigment. It weighs 323 grains.

From a lady aged 60; after complete obstruction of the bowels for ten days, with but little vomiting and moderate pain, the calculus was passed in two pieces. Recovery. *See Path. Trans.*, vol. xxxviii, p. 162.

1986[77] Gall-stone causing Intestinal Obstruction. Dr. PYE-SMITH.

The calculus is cubical in shape, with well-marked facets, and weighs 270 grains. It consists chiefly of cholesterin with a friable coating of dark bile-pigment.

From a lady aged 78; no action of the bowels for a week. A freely movable tumour was felt through the wall of the rectum. Under treatment the calculus was voided, and the patient made a good recovery. *See Path. Trans.*, vol. xxxviii, p. 160.

2022[61] Misplaced Kidney ... ... Dr. CARRINGTON.

The left kidney was situated in the pelvis, in front of of and below the sacral promontory. It is not of normal shape but ovoid, probably from being subjected to a different pressure in its unusual situation. The left renal artery arises from the bifurcation of the aorta, and its vein runs into the right internal iliac at its junction with the external. The ureter was short, and ran directly into the bladder from the lower part of the organ. It should be noted that the left suprarenal is not displaced, and has a normal vascular supply. There are two small arteries to the right kidney.

Clara D., 39; *see Insp.*, No. 35, 1884.

2027[10] Tumour of Kidney of Doubtful Nature ... Dr. GOODHART.

A left kidney seen on section, showing a large tumour embedded in its upper end. It has a dense capsule, and the kidney structure is spread over its lower margin. When first examined it was firm on section, and looked like a mass of solid blood-clot, but it has shrunk considerably from being in spirit, and thick fibrous trabeculæ are now seen running in from the capsule, and dividing the tumour up into spaces filled with partially decolourised blood-clot. The corresponding suprarenal was healthy. The opposite kidney contained several small white nodules, and the mesenteric glands were enlarged, but the other viscera were normal. Microscopic examination showed that the tumour consisted of small pieces of new growth mingled with a quantity of clot. The growth was composed of alveoli filled with cells of very variable size and shape. Many of them were altered by mutual pressure and presented an angular outline. The periphery of the tumour was formed of dense fibroid material, and outside this was a zone of compressed renal tissue.

Robert B., 49; a year ago he first had pain in the left loin, and soon after noticed a swelling there, which gradually increased in size. Admitted with hæmaturia, emaciation, and marked anæmia; he rapidly sank. *See Insp.*, No. 91, 1881.

2077[51] Renal Calculus ... ... Dr. WHITE.

A small dark stone flattened from before backwards, and finely spiculated on the surface. It contains oxalate and phosphate of lime, with traces of magnesia, but no uric acid.

John D., 41; died of gout and granular kidneys. The calculus was lying loose in the pelvis of the kidney, and the ureter was not dilated. No history of colic. *See Insp.*, No. 37, 1886.

2080[60] Dilatation of one Ureter ... ... Dr. WHITE.

A portion of the base of a bladder with its ureters laid open. The left is extremely dilated, measuring an inch and three quarters in its widest part, but only a quarter of an inch as it passes through the vesical wall. The right ureter

is normal. There is a stricture of the urethra. The bladder is markedly hypertrophied. No explanation of the great inequality in the size of the ureters could be found.

Samuel S., 48; admitted in a comatose condition from alcohol, and died four days later of gangrenous pneumonia. Post mortem, there were two old tight strictures of the urethra, the pelvis of left kidney was dilated and its medulla atrophied, but the right kidney was healthy. *See Insp.*, No. 69, 1887, and *Path. Trans.*, vol. xxxix.

2083[15] Extroversion of Bladder ... ... Mr. BRYANT.

Parts dissected to show epispadias and ectopia vesicæ. The posterior wall of the bladder is seen as a rugose surface, and below this is the stunted penis with its prepuce attached entirely to the under surface of the glans. The ureters are marked by red rods, and the inguinal canals by blue.

David D., 5 months; died of peritonitis after a plastic operation to relieve the deformity. *See S. R.*, Mr. BRYANT, No. 4, 1886.

2087[80] Large Sacculus of the Bladder ... ... Mr. HOWSE.

The bladder is laid open by the removal of its anterior surface. Attached to its left side is a cyst the size of a small lemon, which communicates with the bladder by an opening, three quarters of an inch in diameter, a little above the orifice of left ureter. Its wall is composed of mucous membrane and fatty tissue, and contains a few irregularly arranged bundles of muscular fibres. Near the orifice of right ureter is a small sacculus formed by a hernia of the mucous membrane.

James G., 56; had suffered from pyuria for four years, and died of prostatic abscess, cystitis, and granular kidneys. *See S. R.*, Mr. HOWSE, No. 90, 1885.

2147[25] Catheter retained four months in Bladder. Mr. DURHAM.

Its extremity is embedded in phosphatic deposit, and at the back of the specimen are further portions of the deposit, which were broken off in extracting it.

Henry P., 47; had stricture of the urethra for eight years, which was treated by perineal section. The catheter was retained in the perineal

fistula for four months without being changed. *See S. R.*, Mr. DURHAM, No. 99, 1880.

2228[50] Suppurative Ovaritis ... ... Dr. GOODHART.

The posterior surface of uterus and its appendages are seen matted together by inflammation. On the left side is a large cavity, two inches in diameter, the interior of which is remarkably rugose and lined with caseous pyogenic membrane. There is a similar, though much smaller, cavity on the opposite side. They represent the ovaries, and contained curdy pus when first examined. The right Fallopian tube is dilated and doubled back, its termination being adherent to posterior surface of uterus and right ovary. A red rod has been passed into its canal, but the uterine end is blocked.

Catherine H., 24; caught cold during menstruation, and was admitted with globular swellings in both broad ligaments. Subsequently pus was discharged from the bladder and rectum. Died of lardaceous disease. *See Insp.*, No. 394, 1885.

2216[70] Tuberculosis of the Uterus ... ... Dr. GALABIN.

The cavity of a uterus laid open, the lining membrane of which is rugose and much thickened. Microscopic examination shows many large giant-cells, with the small-celled growth and early caseation of tubercular disease.

Mary B., 36; admitted for profuse purulent discharge from the vagina. The cervix uteri formed an irregular ulcerated mass resembling cancer. Hysterectomy performed. Death resulted from suppurative peritonitis. Post mortem, adherent pericardium, and enlargement of the pelvic glands were found. *See Insp.*, No. 142, 1887; and *Trans. Obstet. Soc.*, 1887, p. 301.

2300[25] Recurrent Sarcoma of Breast ... ... Mr. BRYANT.

A lobulated tumour removed from the breast, which constituted the twentieth recurrence. It is adherent to muscle, and its minute structure consists of fibrifying sarcomatous tissue with a softer and more cellular periphery.

See case of Mrs. T., 64; BRYANT, *Diseases of Breast*, p. 335.

2340[50] Capsulitis of Testicle ... ... Dr. PITT.

A vertical section shows great thickening of the tunica albuginea with adhesion of the vaginalis, the serous cavity

being entirely obliterated. At the upper part of the specimen two large cysts are seen, which have developed in relation with the globus major. The seminal tubes and cord are healthy.

From a man aged 55, who died of chronic Bright's disease, but there is no further history.

2357[10] Sarcoma of Testis ... ... Mr. SYMONDS.

A large tumour of the testis, weighing twelve ounces, seen on section. The new growth is undergoing extensive degeneration, and a large wedge-shaped piece at the bottom is sloughing. The cavity of the tunica vaginalis is obliterated except at the upper end, where it contained a little serous fluid. The cord is thickened. Histologically it is composed of a delicate stroma enclosing large round cells of a very uniform size. In some places the stroma has a distinctly alveolar arrangement.

William R., 48; swelling of testis commenced a year ago, and increased rapidly during last three months. Castration performed, but recurrence took place within six months, and was soon followed by an enormous enlargement of the inguinal and lumbar glands. He died a few weeks later. *See S. R.*, Mr. SYMONDS, No. 11, 1886.

2377 Hydrocele of Canal of Nuck ... ... Dr. GOODHART.

The vaginal process of peritoneum or canal of Nuck is laid open, showing the round ligament beneath it. It terminates in a cul-de-sac, beyond which is a cystic dilatation of the canal, filled when recent with clear yellowish fluid.

Louisa H., 23. *See Insp.*, No. 359½, 1885.

2506[50] Irreducible Umbilical Hernia ... ... Mr. HOWSE.

A vertical section through the hernia and the adjacent abdominal wall. The rupture consists entirely of omentum, which is thickened and adherent all round the neck and body of the sac, so that the peritoneal covering is not easily distinguishable.

Emma M., 74; *see Insp.*, No. 404, 1886.

2506[74] Fæcal Calculus from Hernial Sac ... Mr. DURHAM.

Removed from an umbilical hernia containing sloughing omentum, and a diverticulum from the colon in which the calculus was included.

Eliza G., 56; the hernia had been strangulated nine days, and was gangrenous. During operation the diverticulum ruptured, and the calculus was liberated. Patient made a good recovery. *Vide S. R.*, Mr. DURHAM, No. 73, 1882.

2522[80] Uterus and Placenta after Porro's Operation. Dr. GALABIN.

A uterus laid open in front by a long median incision, showing a placenta *in situ*.

Anne P., 28; admitted in the eighth month of pregnancy with a contracted pelvis. Porro's operation performed. Two years later the mother and child were in good health.

2546[55] Congenital Sacral Tumour ... ... Mr. BRYANT.

A large sacral tumour supporting a malformed limb with digits and nails. The tumour is composed of soft granular fat in which the pieces of bone at the side of the specimen were embedded. It is an example of parasitic fœtus.

Rhinolith ... ... Surgeon-Major E. BOVILL.

A series of fragments which originally formed a mass, weighing when dried 165 grains. No nucleus was discovered in the mass. It is composed chiefly of phosphate of lime with traces of oxalate.

Removed from the left nostril of a Hindu, aged 40, by crushing. There was a history of sanious ozæna for two years, with swelling of the left nostril and face, and facial paralysis. *See Brit. Med. Journ.*, 1886, vol. ii, p. 718.

Tænia Solium from a Dog ... ... Mr. EVANS.

LIST

OF

GENTLEMEN EDUCATED AT GUY'S HOSPITAL

WHO HAVE PASSED THE

EXAMINATIONS OF THE SEVERAL UNIVERSITIES, COLLEGES,

&c., &c.,

IN THE YEAR 1887.

University of Oxford.

Examination for the Degree of Master of Surgery.

W. H. A. Jacobson.

Final Examination for the Degree of Bachelor of Medicine and Surgery.

F. S. Hawkins.

Intermediate Examination in Materia Medica.

F. H. Brown. | G. H. Pennell.

University of Cambridge.

Third Examination for the Degree of Bachelor of Medicine.

Part II.

F. Beard.	F. R. B. Bisshopp.
E. P. Manby.	A. S. Taylor.
C. J. Whitby.	A. H. Williams.

Part I.

F. R. B. Bisshopp.	T. E. Mitchell.
A. T. MacConkey.	C. J. Whitby.

Final Examination for the Degree of Bachelor of Surgery.

F. R. B. Bisshopp. | A. H. Williams.

Second Examination for the Degree of Bachelor of Medicine.

Part II.

A. Ellis Durham.	H. A Smith.
C. R. A. Sutton.	F. G. Swayne.

Part I.

A. G. W. Bowen.
F. Colclough.
G. H. S. Daniell.
E. J. D. Mitchell.
R. J. Roberts.
W. Winslow.

Examination for the Diploma in Public Health.

H. A. Fotherby.

University of London.

Examination for the Degree of Doctor of Medicine.

W. T. F. Davies.
G. E. Halstead.
J. G. Harsant.
G. R. Marsh.
R. M. H. Randell.
J. W. Washbourn.

Examination for the Degree of Master of Surgery.

F. F. Burghard.
J. H. Targett.
A. E. Price.

Final Examination for the Degree of Bachelor of Surgery.

First Division.

W. F. Clarke.

Obtained Second-Class Honours.

A. H. Tubby.

Obtained the Gold Medal.

W. N. Risdon.
H. E. Vincent.
C. F. Routh.

Second Division.

W. L. Braddon.

Obtained First-Class Honours.

C. Caldecott.
S. E. Prall.
J. Heatherley.

Final Examination for the Degree of Bachelor of Medicine.

First Division.

W. L. Braddon.

Obtained the Scholarship and Gold Medal in Forensic Medicine, First-Class Honours in Medicine, and in Obstetric Medicine.

C. Caldecott.

Obtained Honours in Medicine and in Forensic Medicine.

J. E. Nevins.

Obtained Honours in Forensic Medicine.

W. N. Risdon.

Obtained Honours in Medicine.

A. H. Tubby.

Obtained the Gold Medal and First-Class Honours in Medicine and Honours in Forensic Medicine.

W. F. Clarke.
H. E. Vincent.
C. F. Routh.

Second Division.

T. Fisher.

Obtained First-Class Honours in Forensic Medicine and Honours in Medicine.

F. Heatherley. | W. I. B. Watson.

Intermediate Examination in Medicine.

First Division.

J. Fawcett.
C. McG. Kitching.
J. S. Richards.
J. Robertson.
R. E. Williams.
F. S. Wood.

Second Division.

A. E. Norburn.

Physiology only.

H. V. Hickman.

Preliminary Scientific (M.B.) Examination.

January.

Two Subjects of the Examination.

Chemistry and Physics.

C. B. Braithwaite. | F. Colclough.
P. McC. Wilmot.

Chemistry and Biology.

E. Huntley.

One Subject of the Examination.

Physics.

J. J. Browne. | E. L. Gutteridge.

Chemistry.

C. B. P. Spencer.

July.

First Division.

A. M. Daldy.
E. S. Dukes.
C. C. Elliott.
S. G. Floyd.
G. H. Gask.
E. T. E. Hamilton.
W. C. Lawton.
P. Lord.
T. D. Manning.
J. H. Muncaster.
A. T. Rake.
H. B. Wilkinson.

Two Subjects of the Examination.

Chemistry and Physics.

N. Instone.

Chemistry and Biology.

E. L. Gutteridge.

One Subject of the Examination.

Chemistry.

A. P. Allan. | F. Hazell.

Physics.

E. S. Hoare. | E. Huntley.

Biology.

C. B. Braithwaite. | T. D. Lister.
C. Butcher. | C. E. Salter.
P. McC. Wilmot.

Examination for the Degree of Bachelor of Science.

Second Division.

F. P. Cresswell.

Intermediate Examination in Science.

First Division.

E. T. E. Hamilton. | W. Cliff.

University of Durham.

Second Examination for the Degree of Bachelor of Medicine.

H. V. Hickman.*

Obtained Honours.

L. W. Keiffenheim.* | W. J. Scott.*

First Examination for the Degree of Bachelor of Medicine.

(Old Regulations.)

J. V. Blachford.*

(New Regulations.)

R. G. P. Lansdown.*

In Elementary Anatomy and Physiology only.

O. B. Shelswell.*

In Chemistry and Physics.

F. Halse-Francis.* | L. W. Keiffenheim.*
W. J. Scott.*

Final Examination for the Degree of Bachelor of Medicine.

W. L. Blight. | F. W. Turtle.

Second Examination for the Degree of Bachelor of Medicine.

F. Halse-Francis. | A. Meyrick-Jones.
R. G. P. Lansdown.

University of Edinburgh.

Final Professional Examination for the Degree of Bachelor of Medicine and Surgery.

W. Wilson.

British Medical Service.

London.

February.

C. S. Spong, Placed 5th. | G. T. Rawnsley, Placed 7th.

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* Passed in 1886, and was omitted from last year's Prospectus.

Netley.

August.

C. S. Spong, Placed 4th. | G. T. Rawnsley, Placed 8th.

Indian Medical Service.

London.

February.

C. H. L. Meyer, Placed 1st. | P. O. W. Hailey, Placed 7th.
W. H. W. Elliot, „ 2nd. | J. H. Sellick, „ 13th.
L. F. Childe, „ 3rd. | E. C. Hare, „ 15th.

Netley.

August.

C. H. L. Meyer, Placed 1st.

Obtained the Herbert Prize.

W. H. W. Elliot, Placed 2nd.

Obtained the Montefiore Second Prize.

L. F. Childe, Placed 4th. | P. O. W. Hailey, Placed 14th.

Royal College of Physicians.

Examination for the Certificate in Hygiene.

J. W. Sanders.

Final Examination for the Licence.

January.

H. E. Crook. | F. H. Knaggs. | G. F. E. Morgan.
S. F. Holloway. | W. Lansdale.

April.

L. H. Brown. | B. C. Gowan. | G. S. Shute.
R. Capes. | C. Metzgar. | H. B. Todd.
F. T. Frost. | M. W. Oldham. | H. E. Vincent.
E. F. Gardner. | W. A. Shelswell.

July.

P. Rose.

October.

W. J. Bearblock. | W. Fisher. | C. A. Lumley.
H. J. Campbell. | C. W. Hogarth. | F. Pearce.
R. J. Cook. | H. W. Lewis.

Royal College of Surgeons.

Final Examination for the Fellowship.

W. L. Braddon. | F. Heatherley. | A. H. Tubby.
F. S. Hawkins. | H. Lund.

First Examination for the Fellowship.

A. D. Fripp. | A. E. Kelsey. | J. Robertson.
J. E. F. Hosking. | A. Meyrick-Jones. | R. E. Williams.
R. D. Mothersole. | A. Parkin.

Final Examination for the Membership.

January.

P. T. Adams.	C. S. Simpson.	A. H. Williams.
H. E. Crook.	F. W. Turtle.	H. M. Brownfield.
L. H. Brown.	M. Younge-Bateman.	S. F. Holloway.
F. T. Frost.	L. A. Bidwell.	D. T. Key.
J. S. Grose.	S. B. de Mesquita.	W. A. Slater.
L. Powell.	E. B. Harris.	R. A. Bindley.
J. F. Rymer.		M. W. Oldham.

April.

R. H. J. Browne.	C. Metzgar.	M. E. A. Wallis.
E. F. Gardner.	G. S. Shute.	J. A. Ward.
B. C. Gowan.	H. B. Todd.	J. A. Wheeler.
C. A. Lumley.	H. E. Vincent.	R. T. Westbrook.

July.

A. Z. C. Cressy.	A. E. Poolman.	E. R. B. Archer.
G. G. O. Phillips.	C. F. Routh.	

October.

W. J. Bearblock.	W. Fisher.	C. W. Hogarth.
H. J. Campbell.	H. Gilford.	F. Pearse.
R. Capes.		

MEDALLISTS AND PRIZEMEN, 1886-87.

The Treasurer's Gold Medal for Clinical Medicine.

Theodore Fisher, Greenwich.

The Treasurer's Gold Medal for Clinical Surgery.

Arthur Henry Williams, Hayton, York.

Gurney Hoare Prize for Clinical Study.

Sidney Wacher, Eddington, Canterbury, } equal.
Robert Capes, Harrogate, }

Beaney Prize for Pathology.

Theodore Fisher, Greenwich.

Mackenzie Bacon Prize for Ophthalmoscopy.

Thomas Halliwell, Dewsbury, Yorkshire.

Mackenzie Bacon Prize for Nervous Diseases.

Ernest Henry Starling, Bombay.

Michael Harris Prize for Anatomy.

Frederick William Hall, Sydney, New South Wales.

Fourth Year's Students.

Arthur Edward Poolman, Sydney, New South Wales, First Prize, £25.
Walter Fisher, Greenwich, Second Prize, £10.

Third Year's Students.

Alfred Parkin, Hightown, Yorkshire, First Prize, £25.
Robert Devereux Mothersole, Colchester, Second Prize, £10.

Second Year's Students.

Frederick William Hall, Sydney, New South Wales, £17 10*s.* } equal.
John Fawcett, Westgate-on-Sea, £17 10*s.* }

First Year's Students.

John Henry Bryant, Ilminster, First Prize, £50.
Bertram Whewell Hogarth, Morecambe, Second Prize, £25.
Arthur Stanley Wohlmann, Hertford, Certificate.
William Gusterson Rogers, Kimberley, South Africa, Certificate.

Open Scholarship in Arts.

Richard Llewellin Wason, Bath.

Open Scholarship in Science.

Alfred Theodore Rake, Fordingbridge.

Physical Society.

Session 1887-88.

Honorary President.—SAMUEL WILKS, M.D., LL.D., F.R.S.

Presidents.

Messrs. G. Black, F. F. Burghard, M.B., B.S., H. J. Campbell, H. E. Crook, H. W. Drew, A. E. Norburn, P. N. Randall, R. M. H. Randell, M.B., J. L. Roberts, B.A., B.Sc., G. B. Smith, E. H. Starling, A. S. Taylor, B.A., M.B., B.Sc., A. H. Tubby, F.R.C.S., S. Wacher, F.R.C.S., J. W. Washbourn, M.B., B.S., F.R.C.S., C. J. Whitby, B.A.

Honorary Secretaries.

W. ARBUTHNOT LANE, M.S., G. NEWTON PITT, M.D.

PRIZEMEN FOR THE SESSION, 1886-87.

The Prize of £6 for the best Paper read during the Session was awarded to Mr. C. J. Whitby for his Paper on "Hydrophobia."

The Second Prize of £4 was awarded to Mr. G. B. Smith for his Paper on "Tubercle."

The Papers of Messrs. Colclough and Campbell were considered worthy of special mention.

The Prize of £5 for the best Essay was awarded to Mr. A. E. Norburn.

CLINICAL APPOINTMENTS HELD IN THE YEAR 1887.

RESIDENT HOUSE PHYSICIANS.

A. H. Tubby. M.B., B.S.
G. E. Halstead, M.D., B.S.
J. Washbourn, M.D., B.S.
A. E. Price, M.D., B.S.
R. M. H. Randell, M.D.
A. S. Taylor, M.B., B.C.

RESIDENT HOUSE SURGEONS.

S. Wacher.
S. E. Prall, M.B., B.S.
F. F. Burghard, M.B., B.S.
S. R. Alexander, M.B.
E. W. Du Buisson.
G. Rowell.

RESIDENT OBSTETRIC ATTENDANTS.

H. Lund, M.B., B.S.
S. W. Owen.
E. Goodall, M.B., B.S.
E. W. Goodall, M.D.
F. H. Knaggs.
W. F. Clarke, M.B., B.S.
E. P. Manby, M.B., B.C.
C. Metzgar.
J. Washbourn, M.D., B.S.
G. E. Halstead, M.D., B.S.
H. Drew.
F. Wyatt-Smith, M.B., B.C.

SURGEONS' DRESSERS.

E. H. Brock.
H. E. Crook.
F. S. Hawkins, M.B., B.Ch.
H. G. Blackler.
F. Pearce.
C. F. Routh.
T. Halliwell.
E. Moss.
H. W. Drew.
H. K. Roper.
S. De B. Mesquita.
R. H. J. Browne.
W. J. Maillard.
R. Capes.
A. H. Williams, M.B., B.C.
G. H. Metcalfe.
J. L. Roberts.
G. Black.
G. H. Pennell.
F. P. Sarjant.
A. T. Mac Conkey.
A. E. Poolman.
A. T. Brown.
H. E. Cuff.
W. G. Brett (one month).

CLINICAL ASSISTANTS.

W. A. Slater.
G. Black.
A. Scott.
W. F. Clarke, M.B., B.S.
T. Fisher.
E. P. Manby, M.B, B.C.
W. N. Risdon.
F. S. Hawkins, M.B., B.Ch.
E. H. Brock.
A. S. Taylor, M.B., B.C.
E. H. Starling.
J. L. Roberts.
T. Wyatt-Smith, M.B., B.C.
A. E. Palmer.
W. P. Smart.
A. H. Williams, M.B., B.C.
H. B. Marriott.
R. A. Sawyer.

DRESSERS IN THE EYE WARDS.

P. N. Randall.
C. A. Lumley.
A. S. Taylor, M.B., B.C.
F. H. Knaggs.
G. F. E. Morgan.
E. C. Andrews, M.B., B.C.
C. Metzgar.
A. H. Johnston.
A. H. Tubby, M.B., B.S.
E. F. Gardner.
T. F. Frost.
H. B. Marriott.
H. E. Vincent.
A. E. Palmer.
H. J. Campbell.
T. Fisher.
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1888.

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WINTER COURSES.

The Winter Session commences October 1st and ends March 31st.

LECTURES.

Medicine.—Dr. PYE-SMITH and Dr. TAYLOR.
Mondays, Wednesdays, and *Fridays,* at Three.

Clinical Medicine.—Dr. PAVY, Dr. PYE-SMITH, Dr. TAYLOR, and Dr. GOODHART.
Saturdays, at Half-past One.

Surgery.—Mr. DURHAM and Mr. HOWSE.
Tuesdays and *Thursdays,* at Half-past Three, and *Fridays,* at Half-past One.

Clinical Surgery.—Mr. DURHAM, Mr. HOWSE, Mr. DAVIES-COLLEY, and Mr. LUCAS.
Wednesdays, at Half-past One.

Ophthalmic Surgery.—Mr. HIGGENS.
Wednesdays, at Three.

Medical Jurisprudence.—Dr. STEVENSON.
Tuesdays, Thursdays, and *Saturdays,* at Ten.

Anatomy, Descriptive and Surgical.—Mr. DAVIES-COLLEY and Mr. LUCAS.
Tuesdays, Wednesdays, Thursdays, and *Fridays,* at Nine.

Physiology and General Anatomy.—Mr. GOLDING-BIRD and Dr. WOOLDRIDGE.
Mondays and *Wednesdays,* at a Quarter to Two; *Saturdays,* at Half-past Nine.

Clinical Lectures on Midwifery and Diseases of Women.—Dr. GALABIN.
Wednesdays, at Half-past One.

Chemistry.—Dr. STEVENSON.
Tuesdays, Thursdays, and *Saturdays,* at Eleven.

Experimental Physics.—Prof. A. W. REINOLD, F.R.S.
Mondays, at Twelve.

Biology.—Mr. BEDDARD, F.R.S.E.
Tuesdays and *Thursdays,* at Two, and *Fridays,* at a Quarter-past Four.

DEMONSTRATIONS.

Practical Surgery.—Mr. JACOBSON and Mr. SYMONDS.
Mondays, Tuesdays, Wednesdays and *Thursdays,* at Four.

Practical Obstetrics.—Dr. HORROCKS, *Fridays,* at a Quarter to Four.

Practical Anatomy.—Mr. J. POLAND, Mr. L. A. DUNN, and Dr. WASHBOURN, *Demonstrators.*

Morbid Anatomy.—Dr. PITT and Dr. PERRY, *Daily,* at Half-past Two.
Mr. TARGETT, *Thursdays* and *Saturdays,* at Half-past Nine.

Ophthalmic Diseases.—Mr. HIGGENS and Mr. BRAILEY.
Tuesdays and *Fridays,* at Half-past One.

Cutaneous Diseases.—Dr. PERRY, *Tuesdays,* at One.

Throat Diseases.—Mr. SYMONDS, *Fridays,* at Two.

Aural Diseases.—Mr. LAIDLAW-PURVES, *Tuesdays,* at One.

Dental Diseases.—Mr. NEWLAND PEDLEY.
Tuesdays, Thursdays, and *Fridays,* at Half-past One.

Practical Physiology.—Dr. WOOLDRIDGE.
Tuesdays and *Thursdays,* at Half-past One.

Morbid Histology.—Dr. PITT and Mr. LANE, Two days in the week.

Practical Pharmacy.—Three days in the week.

SUMMER COURSES.

The Summer Session commences May 1st and ends July 31st.

LECTURES.

Chemistry.—Dr. DEBUS, F.R.S., and Mr. GROVES, F.R.S.
Tuesdays, Thursdays, and *Saturdays,* at Half-past Ten.

Chemical Physics.—Prof. REINOLD, F.R.S., *Saturdays,* at Eleven.

Materia Medica.—Dr. HALE WHITE.
Tuesdays and *Thursdays,* at Two.

Therapeutics.—Dr. HALE WHITE, *Mondays,* at Two.

Midwifery and Diseases of Women.—Dr. GALABIN.
Tuesdays, Wednesdays, Thursdays, and *Fridays,* at Nine.

Clinical Medicine.—Dr. HALE WHITE, Dr. PITT, Dr. WOOLDRIDGE, and Dr. PERRY, *Wednesdays,* at Half-past One.

Clinical Surgery.—Mr. GOLDING-BIRD, Mr. JACOBSON, Mr. SYMONDS, and Mr. LANE, *Fridays,* at Half-past One.

Clinical Lectures on Diseases of Women.—Dr. HORROCKS.
Tuesdays, at Half-past One.

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Hygiene.—Mr. GEORGE TURNER, *Mondays* and *Fridays,* at Half-past Eleven.

Mental Diseases.—Dr. SAVAGE.
Tuesdays, at Eleven, and *Fridays,* at Half-past Ten.

Biology.—Mr. BEDDARD.
Tuesdays and *Thursdays,* at Two, and *Fridays,* at a Quarter-past Four.

Dental Surgery.—Mr. NEWLAND PEDLEY.

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Practical Chemistry.—Mr. C. E. GROVES, F.R.S.
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Operative Surgery.—Mr. JACOBSON.

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* The Prize cannot be awarded to any Essay that is the joint production of two or more authors.

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FOR

VOLS. XXXVI TO XLV

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